DYNATRON

MODELS HFC 50 TO HFC 69 INCLUSIVE AND CASSETTE TAPE UNIT CP1

SERVICE MANUAL

FEBRUARY 197-

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INTRODUCTION

The Models described in this manual are high fidelity instruments of advanced design incorporating the SA 29 Amplifier and SRX 29/SRX 30 Tuner Amplifier chassis.

The Radio Tuner Sections are equipped with an automatic Multiplex decoder circuit and will therefore reproduce stereo radio broadcasts without modification. A "Beacon" lamp shows when a stereo broadcast is being received. Reproduction of stereo radio, gramophone discs and tape recordings is accomplished by a dual channel audio amplifier system designed and built to high standards. Two extra speaker units may be connected for synthesized four-channel listening.

Goldring-Lenco GL78 or Goldring G101 playing decks are fitted, incorporating the Shure M55E Cartridge with elliptical diamond stylus or the Shure M75.6s cartridge with spherical diamond stylus respectively. Sockets are provided at the rear of the units for connecting Aerials, Loudspeakers, etc., as necessary. The tape input/output socket can be used in conjunction with the Dynatron Model CP1 cassette tape unit, or other suitable cassette or reel-to-reel tape recorders.

A socket is provided on the Control panel for the connection of Dynatron Stereo Headphones or other suitable 8 ohm–16 ohm headphones.

Loudspeakers chosen from the wide Dynatron range will complete the installation.

SPECIFICATION SA 29 AMPLIFIER AND SRX 29/SRX 30 TUNER/AMPLIFIER CHASSIS

AMPLIFIER SECTION, ALL MODELS:

Rated Power output, RMS watts:	*Load*	*Single Channel operating*	*Both Channels operating*
	8 ohms	19 watts	15+15 watts
Power Bandwidth:	30Hz—25kHz		
Harmonic Distortion (Inc. Pre Amplifiers):	0·3% at Rated Power Output.		
Frequency Response:	RADIO	30Hz—20kHz ± 1dB.	
	TAPE REPLAY	30Hz—20kHz ± 1dB.	
	PHONO MAGNETIC	RIAA 40Hz—20kHz ± 1·5dB.	
Input Sensitivity at 1kHz:	For an output of 15 watts	RMS into an 8 ohms load.	
	RADIO	180mV (5V max.)	± 2dB.
	TAPE REPLAY	180mV (5V max.)	
	PHONO MAGNETIC	2mV (100mV max.)	
Input Impedance:	RADIO	100K ohms.	
	TAPE REPLAY	100K ohms.	
	PHONO MAGNETIC	50K ohms.	
Tape Output:	180mV via 220K ohms (5V max.) at 1kHz.		
Headphone Jack Socket:	8–16 ohms, 6mm. dia.		
Tone Controls:	BASS	± 12dB at 100Hz.	
	TREBLE	± 12dB at 10kHz.	
Filters:	LOW (lo)	−18dB at 20Hz.	
	HIGH (Hi)	−20dB at 20kHz.	
	CONTOUR	+10dB at 50Hz and +4dB at 10kHz.	
	(Volume Control set at −30dB, less than half travel)		
Balance Control:	+0dB — Zero OP. each channel.		
Channel Separation:	40dB.		
Signal/Noise Ratio, all Inputs:	60dB.		

TUNER SECTION:

SRX 29/SRX 30—Wavebands	TUNING RANGE	AM	MW	185–570 Metres.	1650–525kHz.
			LW	1100–2000 Metres.	285–150kHz.
			SW	49 Metre Band.	6·30–5·95MHz.
	PRE-SET	FM	VHF		87·5–104MHz.

Sensitivity:

AM	LW	15µV for 20dB S/N average.
	MW	10µV for 20dB S/N average.
	SW	10µV for 20dB S/N average.
FM		2·5µV for 35dB S/N } at 100% Modulation
		5µV for 42dB S/N } at 100% Modulation
		10µV for 55dB S/N } at 100% Modulation

Full limiting at 10µV.

Audio Frequency Response.	FM 30Hz–15kHz ± 3dB.
AM Suppression:	40dB at 50µV signal input
Stereo Separation:	40dB at 1kHz
Total Residual Pilot Tone Output:	−50dB relative to 100% Modulation
SCA Suppression:	70dB
AFC:	Pull in range 300kHz Hold in range 350kHz
AGC Range, AM:	6dB change in audio for 70dB change in input level

GENERAL

Semi-Conductors, Amplifier & Power Supply:	22 Si Transistors; 2 Thick Film Microcircuits; 1 Si Bridge Rectifier; 4 Si Protect Diodes.
Additional Semi-Conductors, FM/AM Tuner:	11 Si Transistors; 7 Si Diodes, 1 IC; 3 Varicap Diodes, 1 Zener Diode.
Aerial Input Sockets, DIN Type:	AM Long Wire FM 75 ohms.
Fuses:	Mains Power — 1 Thermal Fuse. (Type No. 3122-014-2506/2) Gramophone Motor — 1, 1·0A/250F (Not SRX 30 Chassis) Amplifiers — 2, 1·6A/250F
Mains Power Requirement:	70 watts max. plus turntable motor and tape deck where fitted.
Mains Voltage Range:	200V–250V AC 50Hz.
Covered in two ranges:	Low, 200V–230V; High, 230V–250V. Set to High range on despatch from factory unless otherwise specified.

NOTE: Above specifications taken at 240V, input, on high setting.

SOCKETS EXPLANATORY NOTES

All instruments have a sockets panel located at the rear of the cabinet and the layouts are as shown in Figs. 1–3, details as follows:

A. Systems Switch for normal stereo or synthesised four channel operation, see notes on Page 5.

B. C. RH and LH main loudspeaker sockets for normal stereo; and the front loudspeakers for synthesised four channel operation.

D. E. Sockets for remote (extension) loudspeakers for normal stereo, or for the rear pair of speakers for synthesised four channel operation.

F. Tape recorder socket for connecting an external tape recorder.

G. Radio input socket for the connection of an external radio tuner (non-radio models only).

I. Internal/external AM aerial switch, in the "INT" position reception is via the internal ferrite rod aerial on LW and MW only, in the "EXT" position an external long-wire aerial has to be used, in the case of SW a long-wire aerial has to be used at all times.

J. Aerial sockets for AM and VHF/FM aerial connection.

AM Aerial for long, medium and short wave, high impedance long-wire, etc. Connections should be made using the DIN style plug supplied and marked AM, note that the pins of this plug are angled to ensure correct connection for aerial and earth wires.

VHF/FM Aerial. 70–80 ohm co-axial feeder may be connected to this socket using the plug supplied and marked FM.

Loudspeakers. The external loudspeakers should be connected to the two-pin DIN pattern sockets provided. All Dynatron loudspeaker units are supplied with a suitable plug fitted to the connecting cable. If other types of loudspeaker are to be used they should be of 8 ohms impedance and preferably a matching pair. Ensure correct polarity when wiring the plugs.

Note. Should it be desired to use 4 ohm loudspeakers from Dynatron's previous range or other makes of 4 ohm loudspeaker it must be pointed out that only one pair of speakers can be used at any one time, thus with 4 ohm loudspeakers in use it is not possible to have both main and remote speakers in operation nor is it possible to use the synthesised four-channel configuration. To assist in identification, in recent years Dynatron's 4 ohm loudspeakers have had a type number ending in figure 4, for example LS 1434 and Dynatron's 8 ohm loudspeakers have a type number ending in figure 8, for example LS 2528.

Tape. A standard five-pin DIN pattern plug should be used with connections as shown in Fig. 4A or Fig. 4B for mono or stereo tape recorders.

External Radio Tuner. A standard five-pin DIN pattern plug should be used with connections as shown in Fig. 5A or Fig. 5B for mono or stereo radio tuners.

Stereo Headphones. Dynatron's stereo headphones are high quality units of 8 ohms impedance and may be connected to these instruments using the jack socket provided on the control panel.

GENERAL NOTES

VHF/FM Broadcasts

Frequency Modulation (FM) is a technique used in high quality radio transmissions on the Very High Frequency (VHF) broadcasts. This system offers an excellent standard of radio reception which is free from atmospheric interference.

Your Dynatron model is equipped to receive Stereophonic transmissions on these frequencies using the Zenith/G.E. Pilot Tone system, as well as normal monaural broadcasts.

AERIALS

VHF Reception. An internal mains aerial is provided for reception in areas of high signal strength, e.g., in close proximity to the transmitter. However, to take full advantage of the excellent quality of the transmissions and the very low background noise level obtainable, we strongly recommend the use of the best aerial system that can be conveniently installed.

Because of the technicalities of Stereo Radio transmission and reception it is necessary to provide a stronger signal at the receiver for this type of broadcast than for normal monaural broadcasts.

The "Stereo Signal" beacon light will be illuminated automatically when a stereo signal is received.

Long, Medium and Short Wave (AM) Reception. An internal "Ferrite" bar aerial is provided for Long and Medium wave reception and will prove adequate in many locations. Should the instrument be positioned so that signal pick up is not sufficient an external aerial should be connected to the socket marked "AERIALS AM" using the plug provided, for Short wave reception an external aerial is advised at all times.

Your Dynatron dealer will be pleased to advise you on a suitable aerial for VHF (FM) or ordinary (AM) broadcast reception.

MAINS SUPPLY

These instruments are designed to operate from 200–250 volt, A.C. 50 Hz (cycles) mains supplies. They must NOT be connected to a D.C. supply.

SCALE LAMPS

SA 29 Chassis: Mains Indicator, 12V, 0·15A MES.

SRX 29 Chassis: Stereo Beacon Lamp, 14V, 40mA, LES; Dial Lamps, 2 × 6·5V, 1 Watt LES and 2 × 6·5V, 0·3A MES.

SRX 30 Chassis: Stereo Beacon Lamp, 14V, 40mA LES; Dial Lamps 3 × 6·5V, 1 Watt LES and 1 × 6·5V, 0·3A MES.

REAR SOCKETS PANELS

CHASSIS SRX29

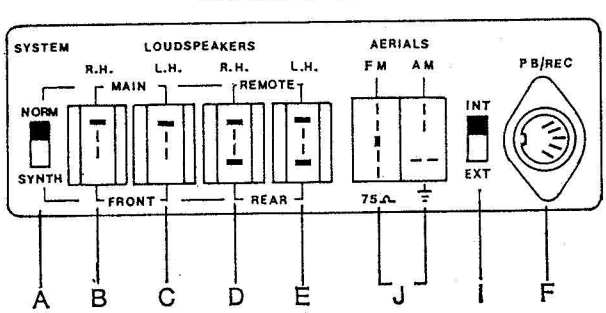


Fig. 1

CHASSIS SA29

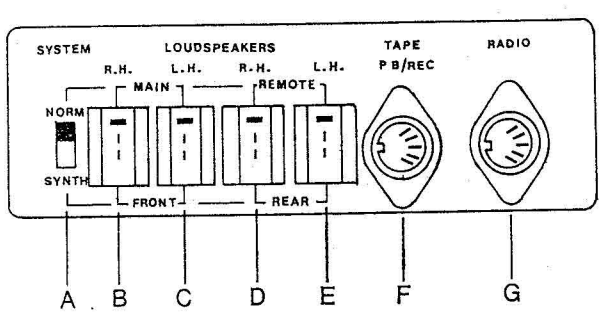


Fig. 2

CHASSIS SRX30

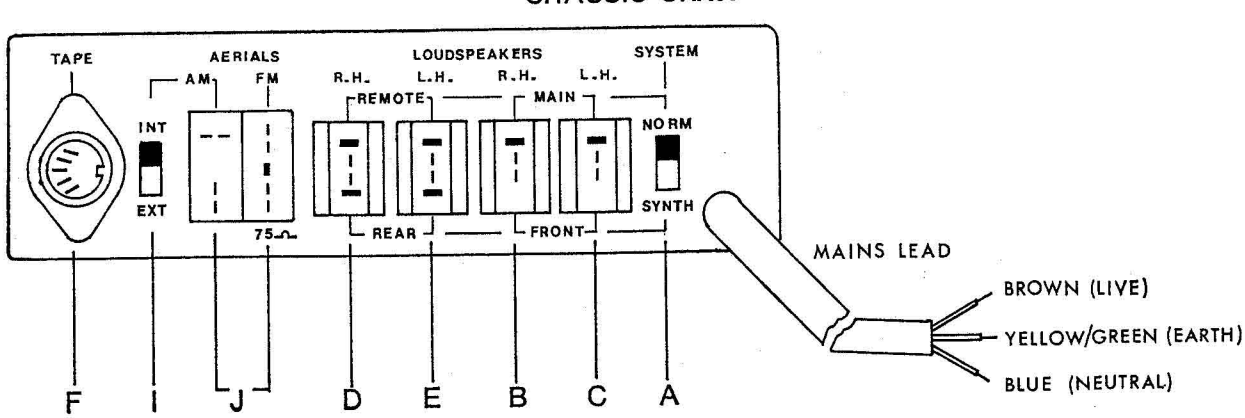


Fig. 3

CONNECTIONS AS VIEWED FROM WIRING SIDE OF SOCKETS

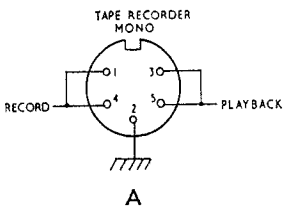


Fig. 4

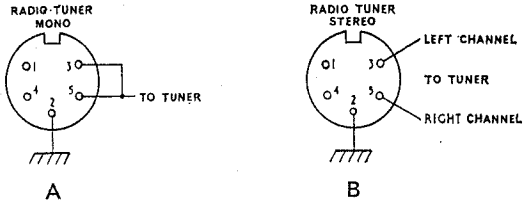


Fig. 5

FOUR CHANNEL OPERATION

SYNTHESIZED FOUR CHANNEL SYSTEM

This system takes the "difference signals" from normal stereo sources, relays them through an additional pair of speakers which, when suitably placed, produce an ambiophonic effect. Using this facility makes the position for maximum stereo effect much less critical.

To take advantage of the synthesized four channel output facilities, two extra loudspeakers are required positioned as LH2 and RH2, Fig. 7, note that the two front stereo speakers are shown facing the rear speakers and not angled as for normal twin-channel stereo listening, but under given acoustic conditions the position of the speakers relative to one another may be varied slightly. To produce the best four channel effect some experiment may therefore be necessary.

For best results all the four speaker units should be identical but if this is not possible or practicable then the two smaller units should be used in the rear position, note however that all four speakers must be of the same impedance, **not less than 8 ohms,** which is the optimum value, but 16 ohm speakers can be used if desired.

To use your equipment for synthesized four channel listening the two front speakers should be connected in the speaker sockets "MAIN" making sure that the right- and left-hand sense is maintained.

The two rear speakers should be connected into speaker sockets "REAR" again ensuring that the right-hand speaker is connected to the "RH" socket and vice-versa.

Note that the position of all four speakers in respect of their left- and right-hand sense is that the front and rear units on your right-hand side when you are facing the front pair of units are both right-hand speakers, i.e., RH1 and RH2 in Fig. 7 are the right-hand units and LH1 and LH2 are the left-hand units.

On Chassis SA29 the loudspeaker buttons "MAIN" and "REMOTE" should both be depressed and on this chassis and chassis SRX 29 and SRX 30 the synthesized four channel control switch on the rear panel marked "NORM" and "SYNTH" should be moved to "SYNTH".

Operation of the other controls of your equipment remains exactly the same as for normal stereo listening.

It may be found that the degree of four channel effect varies considerably with different programme material.

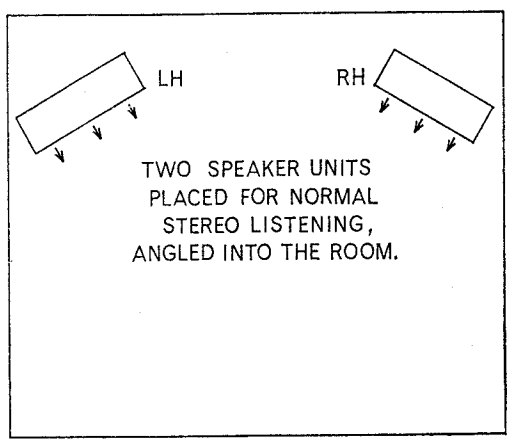


Fig. 6

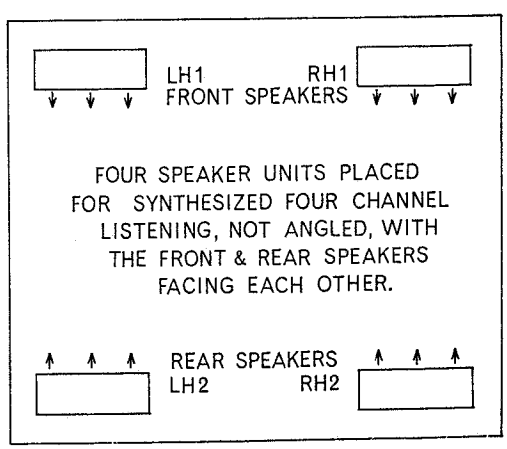


Fig. 7

INSTALLATION

The particular model should be installed by the Dynatron Appointed Dealer and the following is a guide as to what should be done by him before the instrument may be operated.

PLEASE NOTE CAREFULLY THIS PARAGRAPH

1. Fit a suitable plug to the three-core mains lead taking care that the colour coding of the three wires is strictly observed. The colour code used is to the new standard and the BROWN covered wire must go to the "L" or live pin of the plug. The LIGHT BLUE wire is the neutral connection and must be attached to the "N" or neutral pin. GREEN/YELLOW is the colour of the earth wire which must be attached to the "E" or earth pin.
2. If you intend to use a two pin plug consult your Dealer before connecting to the mains supply. UNDER NO CIRCUMSTANCES connect the GREEN/YELLOW wire to any point other than the "E" or earth pin of a three-pin plug.

LOUDSPEAKERS, AERIAL AND EARTH

Connect the loudspeakers to the appropriate left- and right-hand sockets at the rear of the cabinet. Also make any external aerial or ground (earth) connections as required.

RECORD PLAYING UNIT – GOLDRING-LENCO GL78

This unit is fitted in Models HFC 52, HFC 53, HFC 56, HFC 57 and HFC 59, and the pick-up cartridge used in these models is the Shure M55E. The Goldring-Lenco GL78 unit is a precision engineered transcription turntable unit incorporating many modern refinements. It is simple to operate but it is very important that certain items are correctly assembled and positioned before the unit is put to use for the first time. This work will normally be carried out by your Dealer at the time of installation and full details are given in the GL78 instruction manual which is supplied with your model. We recommend that this manual be read thoroughly before attempting operation. The Shure M55E magnetic stereo cartridge fitted, has an elliptical diamond stylus designed to play mono and stereo records of speeds 33⅓ or 45 r.p.m. only. DO NOT play 78 r.p.m. records with this stylus. The recommended stylus pressure is 1 gram. This stylus pressure and the anti-skating bias adjustment should be set as detailed in the GL78 instruction manual.

IMPORTANT. The turntable fitted to the GL78 unit is a heavy casting, for this reason the turntable should **NEVER** be left in the playing position if the unit is to be transported for any reason. The packing should be retained for transit use.

DYNATRON RADIO LTD. CANNOT ACCEPT RESPONSIBILITY FOR DAMAGE THAT MAY OCCUR IF THE TURNTABLE AND COUNTERBALANCE WEIGHTS ARE LEFT IN POSITION AND THE MOTOR TRANSIT SCREWS ARE NOT TIGHTENED PRIOR TO TRANSIT OF ANY KIND.

GOLDRING G101 TRANSCRIPTION UNIT

Fitted to models HFC 50, HFC 51, HFC 54, HFC 55, HFC 60, HFC 62, HFC 63, HFC 64, HFC 65, HFC 66, HFC 67, HFC 68 and HFC 69, together with the Shure type M75.6s cartridge. The remarks in the preceding paragraph, applicable to the Goldring-Lenco GL78 unit, are also applicable to the Goldring G101 unit and you are strongly advised to thoroughly read the G101 instruction manual supplied before attempting to put this unit into operation. The Shure M75.6s cartridge has a spherical stylus designed to play 33⅓ or 45 r.p.m. records only. DO NOT play 78 r.p.m. records with this stylus. The recommended stylus pressure is 2 grams. This stylus pressure and the anti-skating bias adjustment should be set as detailed in the G101 instruction book.

STYLUS REPLACEMENT OR EXAMINATION GL78 and G101 UNITS

These styli are easily removed, but first release the pick-up cartridge shell from the pick-up arm by turning the knurled clamp ring and withdrawing the shell from the arm.

Turn over the shell to bring the cartridge uppermost and grasp the stylus housing—coloured cream—and withdraw gently from the body of the cartridge. To replace the stylus, similarly grasp the stylus housing and with the stylus point uppermost insert the stylus guide tube into the aperture of the cartridge body; push home until the stylus housing is flush with the body.

Replace the pick-up shell on the pick-up arm and tighten the knurled ring to secure.

GARRARD TYPE 6-300 RECORD PLAYER UNIT FITTED IN MODEL HFC 58, also fitted with the SHURE M75.6s CARTRIDGE.

The Garrard type 6-300 record player unit is very simple to set up and operate but you are advised to thoroughly familiarise yourself with the operation of this unit by reading carefully the Garrard instruction manual supplied before setting the unit into operation.

The Garrard 6-300 unit is primarily intended to be used as a single record player with automatic or manual pick-up operation as required.

If it is intended to use this unit as an autochanger, read carefully the instructions for fitting the overarm and autochange spindle which will be found on Page 7.

The Shure M75.6s magnetic stereo cartridge fitted to this unit has a spherical diamond stylus designed to play mono and stereo records of speeds 33⅓ or 45 r.p.m. DO NOT play 78 r.p.m. records with this stylus. The recommended stylus pressure is 2·5 grams.

STYLUS REPLACEMENT OR EXAMINATION GARRARD 6-300 UNIT

The information under G101 above is also applicable to this mechanism but in this case the arm is simply raised upwards and the stylus withdrawn from the cartridge with the arm in situ. NEVER CONTINUE TO OPERATE THE INSTRUMENT WITH A WORN OR CHIPPED STYLUS.

TRANSIT SCREWS

In the case of both the Goldring G101 and Garrard 6-300 units the transit screws are an integral part of the mechanism and on delivery will be seen standing proud of the motor board. These screws should simply be screwed downwards until moderately tight when the unit will be released from its mountings and float easily on its mounting springs.

DYNATRON RADIO LTD. CANNOT ACCEPT RESPONSIBILITY FOR DAMAGE IN TRANSIT THAT MAY OCCUR IF THESE SCREWS ARE NOT TIGHTENED IN THE "UP" POSITION PRIOR TO TRANSIT OF ANY KIND.

There are no external transit screws on the Goldring-Lenco Model GL78 unit, but there are transit screws coloured red that have to be released to ensure the drive motor itself is floating and these are accessible under the turntable. You are referred to your Goldring-Lenco instruction book for this information.

GENERAL PRECAUTIONS

Please check that the voltage and frequency of your mains supply is suitable for your equipment, unless specially ordered the equipment will be set to operate on voltages between 230 and 250 volts AC, 50Hz.

Take care not to restrict the air flow over the rear panel and avoid exposing the instrument to extremes of temperature (i.e., below −5°C and above 50°C), excessive moisture, or severe vibration.

Switch off the instrument before making or altering connections to the rear panel sockets. Always install the instrument on a firm support and ensure that the turntable is level. It is possible that the stylus may jump record grooves if the turntable is not level or the support unsteady. If the room floor is inclined to spring try to position the instrument and loudspeakers in the firmest area. Mounting the units on shelves attached to the wall should effect a cure in serious cases, where this is practicable.

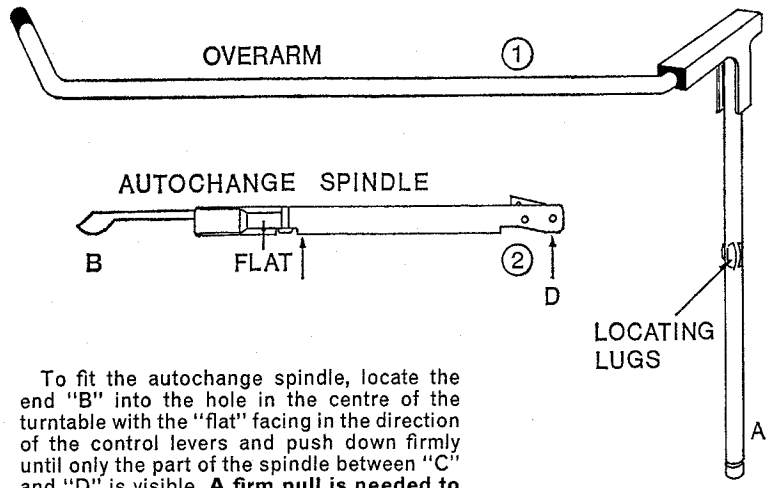
MODEL HFC 58 ONLY

INSTRUCTIONS FOR FITTING OVERARM AND AUTOCHANGE SPINDLE FOR AUTOMATIC RECORD CHANGE OPERATION

The Garrard 6-300 Record Playing Deck fitted to Model HFC 58 is primarily intended to be used as a single record player with automatic or manual pick-up operation as desired, see "Single Record Play" on the Garrard instruction card.

If it is desired to use the automatic facility* for playing up to eight records the small single play spindle must be replaced with the Autochange spindle "2", and the overarm "1" must be fitted.

To fit the overarm hold it in the same position as the illustration above and insert the end "A" into the hole to the left of the pick-up ("F" on the Garrard instruction card), the locating lugs will pass through the slots in the socket; swing the overarm to the right then follow the Garrard instructions under "Automatic Play".



To fit the autochange spindle, locate the end "B" into the hole in the centre of the turntable with the "flat" facing in the direction of the control levers and push down firmly until only the part of the spindle between "C" and "D" is visible. **A firm pull is needed to remove the spindle after use.**

Fig. 8

***WARNING: WHEN THE OVERARM AND AUTOCHANGE SPINDLE ARE FITTED THE LID OF THE INSTRUMENT MUST BE LEFT OPEN. BEFORE CLOSING THE LID THE OVERARM AND AUTOCHANGE SPINDLE MUST BE REMOVED.**

CONTROLS - EXPLANATORY NOTES (Figs. 9, 10, 11)

The Slider Controls 7–8–16–17: These are arranged so that to increase the volume level the slider should be moved to the top of the scale and to increase Bass or Treble the movement is also to the top of the respective scale. In the case of the Bass and Treble controls the mid point is the level setting and below the mid point reduces Bass and Treble response. The Balance Control is set to the mid point for electrical balance, but should it be desired to alter balance to suit room acoustics, etc., then moving the control above the mid point increases the output from the Right Hand channel whilst reducing the output from the Left Hand channel and conversely moving the control below the mid point reduces the output from the Right Hand channel and increases the output from the Left Hand channel.

Loudspeaker Switches 5–6 (Chassis SA 29 only): These are marked "Main" and "Remote". It is possible to connect two sets of stereo loudspeakers to models using this chassis, one pair to channel "Main" and the other pair to channel "Remote". If one or the other button is depressed the appropriate loudspeakers will operate, if both are depressed then both sets of loudspeakers will operate. If both buttons are released then both sets of loudspeakers will be silent but the headphone socket on the front panel is still live, allowing for "silent" listening using a pair of Dynatron stereo headphones if desired.

Mode (Mono/Stereo) Switch 9: This switch is intended to be used in the appropriate position when playing either Mono or Stereo records. Additionally it should be moved to the Mono position when making a recording from a Stereo source to a non-Stereo (Monaural) tape recorder; when playing back from a Mono tape recorder it may be necessary to move this switch to the Mono position to ensure that the sound comes from both channels.

Tape Monitor Button 4 (SA 29 Chassis only): When used with an external tape recorder of the semi-professional type fitted with a separate Monitor head and separate record playback amplifiers, assuming the tape recorder controls are set to monitor, this button enables the operator to monitor (listen to) both the source (e.g., record/radio) when in the up position and when depressed hear the actual recording direct off the tape a fraction of time after the recording has been made giving an immediate comparison between the before and after mode.

Buttons 1–2–3–18: These are for selecting the source required, e.g., radio (external tuner, Chassis SA 29), tape recorder playback (either external, or both internal and/or external model HFC 60) and disc (gramophone record) playback.

Buttons 19–20–21: Select either the long wave, medium wave or short wave (49 metre band) wavebands as required.

HI (High) Filter Switch 10: This Filter should be switched in only when a worn or noisy record has to be played, it will assist in reducing the background noise (hiss) on such records.

LO (Low) Filter Switch 14: When switched in this filter will assist in reducing low frequency interference.

Contour Filter Switch 15: When playing equipment at a low volume level, due to the well known loss of efficiency of both loudspeakers and the human ear to bass frequencies at these levels of sound, a lack of bass may be apparent; operating this switch compensates automatically for loss of bass at low volume levels, the compensation decreasing as the volume control is advanced.

AFC Switch 28: When switched on the automatic frequency control circuit comes into operation and locks the VHF tuning onto the station selected, thus minimising the effect of drift. AFC should be switched off when tuning otherwise it is difficult to find the exact tuning point.

Note 1: To set the Balance control correctly, either a Monaural record, or a special stereo balancing record should be used, balance is correct when monaural sound appears to be coming from a point midway between the two loudspeakers, depending on room acoustics and the listening position relative to the loudspeakers, this may not necessarily be at the "0" or electrical balance point.

Note 2: The Stereo beacon lamp glows red when a Stereo broadcast is being received, the decoder circuit is switched in automatically by the pilot tone signal which is part of the overall Stereo information and the beacon lamp merely indicates that the radio receiver section has switched itself to the Stereo Mode. **Certain programmes from various transmitters may carry the pilot tone signal even though the transmitted material is not Stereo. Under these circumstances the beacon lamp will glow but the reduced material will not be in Stereo. On the BBC services Stereo broadcasts are marked as such in the Radio Times.**

Note 3: The Mains Indicator Lamp (12) ctted to Chassis SA 29 is to indicate that the instrument is switched on with mains power applied, it is not fitted to chassis SRX 29 and SRX 30 as the dial lamps perform a similar function.

CONTROLS

MODELS HFC 50, HFC 51, HFC 52, HFC 53

CHASSIS SA 29 Fig. 9

1. Disc (Record Player) Button.
2. Tape (Play-Back) Button.
3. Radio Button.
4. Tape Monitor Button.
5. { Int/Ext. Speaker Switch Buttons giving
6. { MAIN, MAIN+REMOTE, REMOTE and OFF Positions.
7. Bass Control Slider.
8. Treble Control Slider.
9. Stereo/Mono Mode Switch.
10. Hi (High) Filter Switch.
11. Mains On/Off Push Button.
12. Mains Indicator Light.
13. Stereo Headphone Socket.
14. Lo (Low) Filter Switch.
15. Contour Filter Switch.
16. Volume Control Slider.
17. Balance Control Slider.

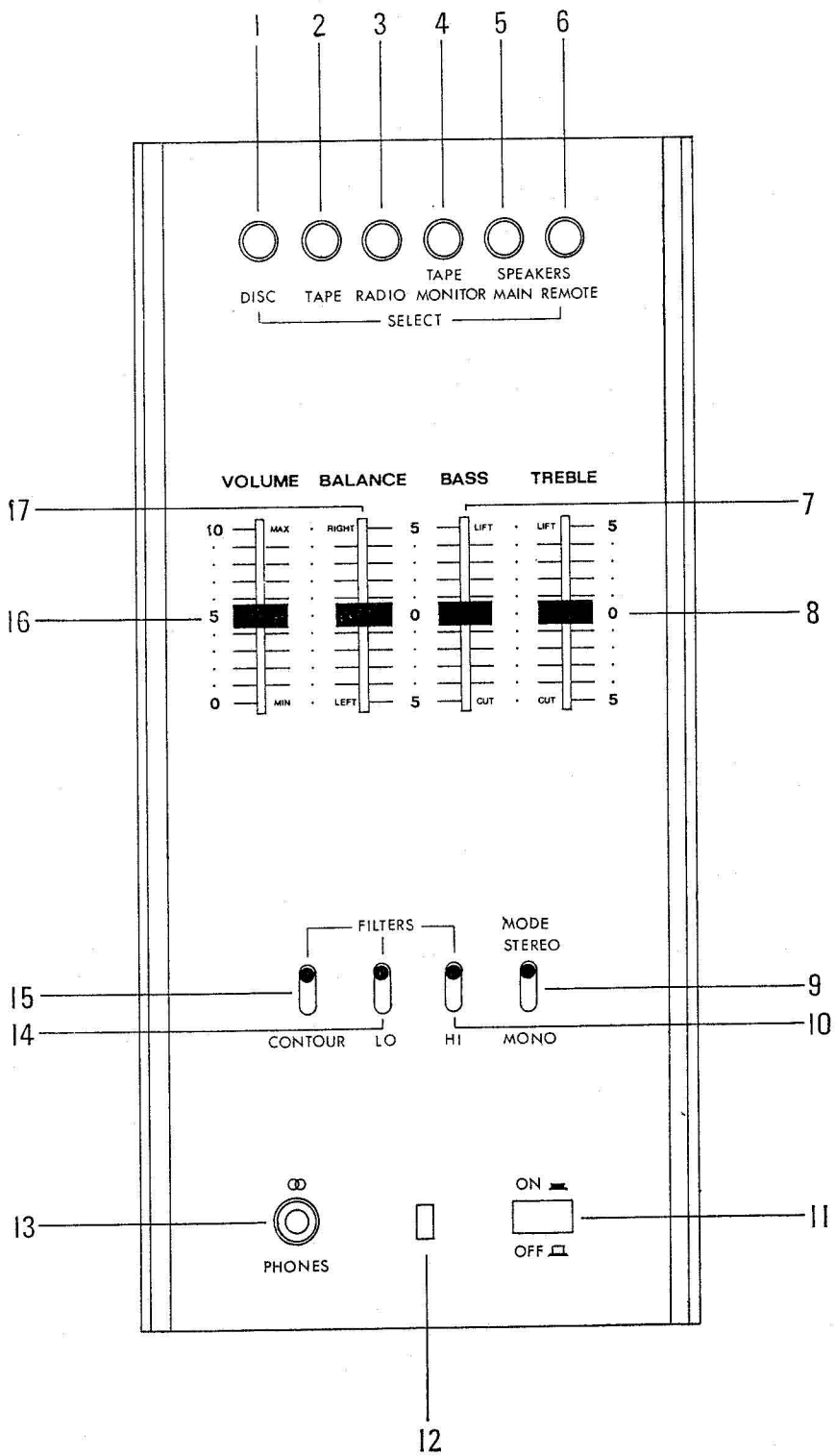


Fig. 9

MODELS HFC 54, HFC 55, HFC 56, HFC 57, HFC 62, HFC 63, HFC 65, HFC 66, HFC 67, HFC 68, HFC 69

CHASSIS SRX 29 Fig. 10

1. Disc (Record Player) Button.
2. Tape (Play-Back) Button.
7. Bass Control Slider.
8. Treble Control Slider
9. Stereo/Mono Mode Switch.
10. Hi (High) Filter Switch.
11. Mains On/Off Push Button.
13. Stereo Headphone Socket.
14. Lo (Low) Filter Switch.
15. Contour Filter Switch.
16. Volume Control Slider.
17. Balance Control Slider.
18. VHF/FM Waveband Selector Button.
19. Long Waveband Selector Button.
20. Medium Waveband Selector Button.
21. Short Wave (49 metre band) Selector Button.
22. Stereo Indicator Beacon Light.
24. 25. 26. 27. Five Tuning Selector Buttons. Tuning is effected by depressing the required button and turning it until the desired channel (Station) is tuned in. The Red Indicator on the appropriate scale shows the approximate frequency to assist in finding the channel required.
28. AFC Switch (should be "OFF" whilst tuning).
29. Manual Tuning Control for LW, MW and SW.
30. AFC Switch Indicator (Red when on).

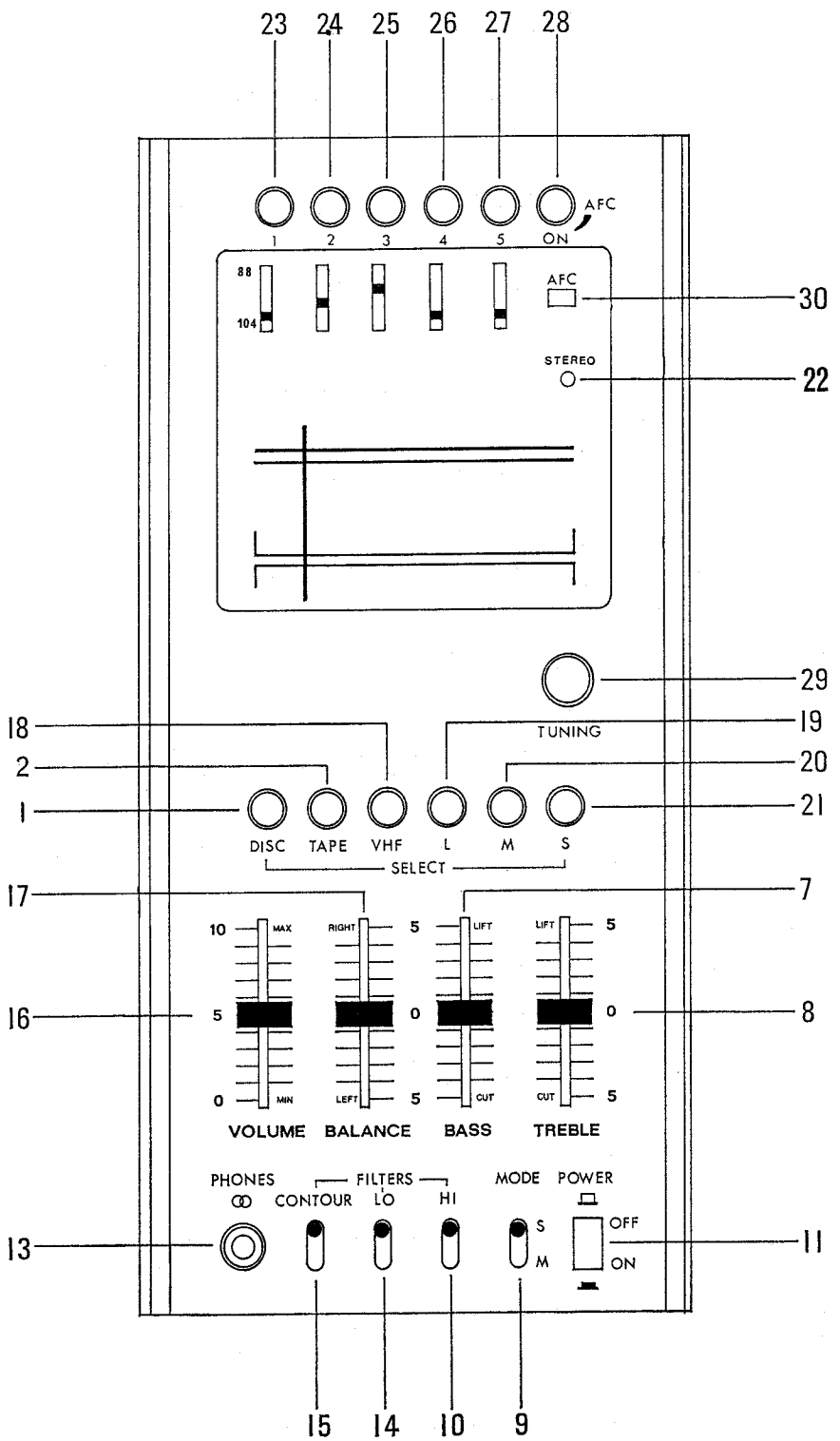


Fig. 10

CONTROLS - MODELS HFC 58, HFC 59, HFC 60, HFC 64

CHASSIS SRX 30

Fig. 11

1. Disc (Record Player) Button.
2. Tape (Play-Back) Button.
7. Bass Control Slider.
8. Treble Control Slider.
9. Stereo/Mono Mode Switch.
10. Hi (High) Filter Switch.
11. Mains On/Off Push Button.
13. Stereo Headphone Socket.
14. Lo (Low) Filter Switch.
15. Contour Filter Switch.
16. Volume Control Slider.
17. Balance Control Slider.
18. VHF/FM Waveband Selector Button.
19. Long Waveband Selector Button.
20. Medium Waveband Selector Button.
21. Short Wave (49 metre band) Selector Button.
22. Stereo Indicator Beacon Light.
23. Five Tuning Selector Buttons. Tuning is effected by depressing the required button and turning it until the desired channel (Station) is tuned. The Red indicator on the appropriate scale shows the approximate frequency to assist in finding the channel required.
24.
25.
26.
27.
28. AFC Switch (should be OFF whilst tuning).
29. Manual Tuning Control for LW, MW and SW.
30. AFC Switch Indicator (Red when on).

CONTROLS - CHASSIS SRX 30

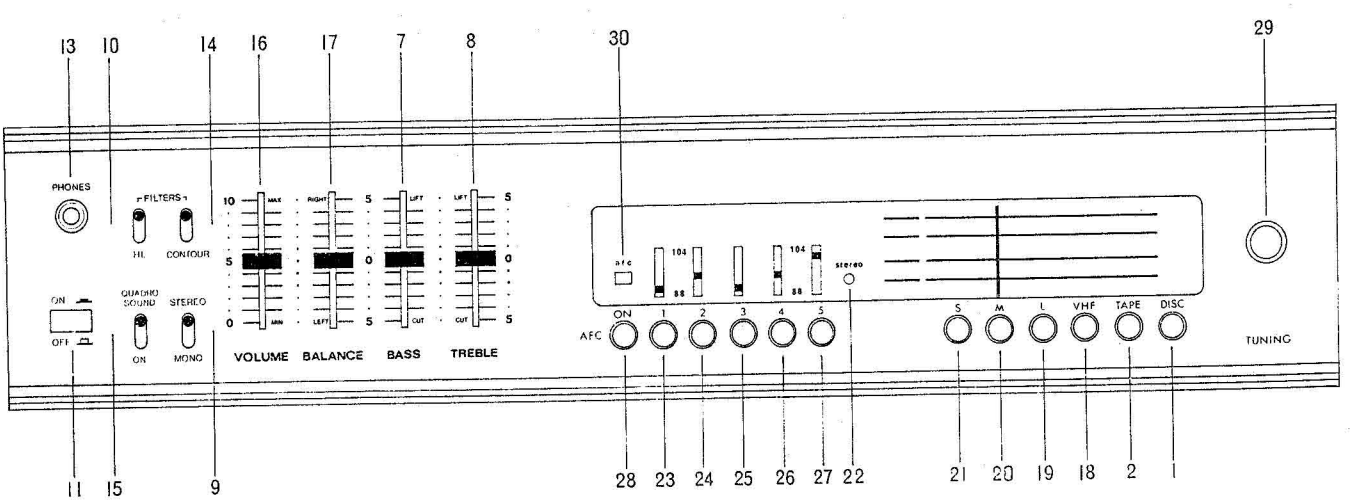


Fig. 11

OPERATION OF THE AMPLIFIER/TUNER AMPLIFIER

GENERAL NOTES

Assuming that the appropriate external connections have been made as required and not before, switch on by depressing the on/off button. Either the mains indicator lamp or the dial lamps should glow indicating that the instrument is operating.

Should these lights not glow, first check that there is power available at the wall power socket, assuming that this is in order contact your Dynatron Appointed Dealer, **do not attempt to dismantle the instrument to locate the reason for the failure to operate.**

Next select the required function; tape, disc or radio, and with the tape recorder or record player operating adjust the volume control to the desired level and the tone controls to suit requirements, in the case of VHF/FM radio depress the "VHF" button and then select buttons 1–5 (reference numbers 23–27 on Fig 10 and 11), depressing the button that has already been pre-tuned to the service required by your dealer. Should these buttons not have been pre-set each button may be set up in turn by depressing and turning it so that the indicator on the scale adjacent to the button shows the desired frequency of the channel required, the AFC switch, reference number 28 should be "OFF' during this operation.

When all buttons have been set correctly the AFC switch should be turned to the "ON" position.

Assuming a stereo broadcast is being received, the stereo indicator light Ref. No. 22, should glow.

To operate the AM radio section select either L, M or S buttons respectively for long wave, medium wave or short wave and then tune with the tuning control, Ref. No. 29, until the desired station is tuned in on the appropriate waveband, adjusting the volume and tone controls to suit personal requirements.

For best siting of your Dynatron Loudspeakers, see the instruction card supplied.

For assembly of the stand/trolley if purchased, see the instruction card supplied with your Dynatron accessory.

For detailed information on the various controls see under the heading "CONTROLS", Page 7.

"REMOTE" LOUDSPEAKER SOCKETS (REVERSIBLE) CHASSIS SRX 29 and SRX 30

These operate in conjunction with the switched headphone jack socket.

With the loudspeakers connected between middle and top of the DIN sockets the switch within the headphone jack does not switch off the remote loudspeakers when the phone jack is inserted. With the remote loudspeaker plugs inverted, (between the middle and lower parts of the DIN sockets) the headphone jack switch will disconnect the remote loudspeakers when the headphone jack is inserted.

The "local" loudspeaker sockets are not reversible and will be disconnected when the headphone jack is inserted.

If "two-room" stereo is being used, the headphones can be used for personal listening with the local loudspeakers automatically switched off when the headphone jack plug is inserted, but the remote loudspeakers in another room, can be on or off depending only on which way round the remote loudspeaker plugs have been inserted. When the equipment is being used in the synthesised four channel configuration (see details on Page 5), inserting a headphone jack-plug silences all four speakers.

ENGINEER'S NOTES

TEST PROCEDURE DATA - CHASSIS SA29, SRX29, SRX30

Test equipment required

1. Multi-range testmeter, Avo 8 or similar, 20,000 ohms/volt.
2. Audio signal generator, 20 Hz–20 kHz, output 1 mV–6 volts (600 ohms) sine wave.
3. FM signal generator, 87–104 MHz FM and AM modulation with 75 ohm dummy load.
4. AM signal generator 200 kHz–7 MHz.
5. Frequency counter to count 19 kHz.
6. Valve voltmeter.
7. Oscilloscope.
8. Stereo encoder (Philips Service Coder or similar).
9. Output meter set to 8 ohms load.
10. Test cassette tape Philips code number 8945 600 11501.

Audio amplifier

1. Check mains supply voltage at 240 volts.
2. Check that HT voltage measured at HT fuse to earth is 42 volts ± 1 volt.
3. Remove HT fuses.
4. Connect test meter set to 100 mA range across left-hand HT fuse holder.
5. Switch AC supply on. Measure DC current to be 16 mA ± 6 mA.
6. Repeat 4 and 5 for the right-hand channel.
7. Switch off AC supply.
8. Remove test meter and re-insert the two 1·6 amp fuses in the fuse holder.
9. Connect AF signal generator between earth and pin 3 of socket F (tape socket) and output meter across the left-hand channel loudspeaker socket with oscilloscope in parallel.
10. Set both bass and treble controls to "Flat" (i.e., central) and balance control to centre. All filter buttons out and volume control at maximum.
11. Switch on AC supply.
12. Set signal generator to 1 kHz and adjust output to 180 mV.
13. The reading on the output meter should be 15 watts ± 1 dB RMS.
14. Re-connect AF signal generator between earth and pin 5 of socket F and output meter and oscilloscope to the right-hand loudspeaker socket and repeat 12 and 13 above.

SRX 29/30

AM tuner section—Alignment procedure AM

Note. Check that the dial pointer is at zero on the logging scale with the tuning gang fully closed.

The IF in use is 470 kHz. The IF amplifier is a Mullard module type LP 1181 which is pre-aligned and these adjustments should not be tampered with.

1. Select MW.
2. Set MW oscillator end stops as follows:
   a Connect AM signal generator to external AM aerial socket (AFC button out).
   b Set the signal generator to 525 kHz with an output of 300 µV.
   c Tune to left-hand end of scale (fully closed gang) and adjust the dust core of T502 to tune the signal.
   d Re-set the generator to 1625 kHz, set pointer to the right-hand end of the scale (gang fully open) and adjust C524 to tune the signal.
   e Repeat *c* and *d* above until the end stops are correctly set, then seal the cores and trimmers with approved adhesive (i.e., cellulose paint).
3. Set the generator to 600 kHz with reduced output and tune chassis to receive signal.
4. Check calibration on scale and trim L604, MW external aerial coil, for maximum output.
5. Set the generator to 1200 kHz and tune chassis to receive signal.
6. Check calibration on scale and trim C59 for maximum output.
7. Repeat 4 to 6 until no further improvement can be made.
8. Seal the cores, trimmers and dial pointer with approved adhesive (i.e., cellulose paint).
9. Set the generator to 200 kHz.
10. Switch to LW, set dial pointer to 200 kHz and trim LW oscillator trimmer C60 to generator signal.
11. Adjust the LW external aerial coil L5 for maximum output, with external aerial switched in.

    Note. In the UK the BBC2, 1500 m, 200 kHz signal can be used instead of the signal generator.
12. Switch to SW and set dial pointer to fully closed gang position.
13. Set generator to 5·9 MHz at 300 µV.
14. Adjust oscillator coil T501 for maximum output.
15. Set tuning gang fully open and set generator to 6·4 MHz.
16. Adjust trimmer C420 for maximum output.
17. Repeat 12 to 16 until no further improvement is obtained.
18. Set the dial pointer to 6·0 MHz on the scale.
19. Set the generator to 6·0 MHz at 10 µV and adjust aerial coil T401 for maximum output.
20. Set the pointer to 6·3 MHz on the scale.
21. Set the generator to 6·3 MHz at 10 µV and adjust aerial trimmer C420 for maximum output.
22. Repeat 18 to 21 until no further improvement is obtained.

Alignment procedure—VHF IF

1. Inject 10·7 MHz sweep signal from the wobbulator into pins 401 and 404 (earth) on FM Tuner Panel (Fig. 14, 15).
2. Connect oscilloscope set to suitable range across pin 411 and earth.
3. Carefully align RF coils on LP1186 and IF coils on LP 1185 for maximum S curve amplitude centred on 10·7 MHz.

Alignment procedure VHF RF

1. Tune pointer to 88 MHz on scale.
2. Connect FM signal generator to FM external aerial socket with the 75 ohm dummy load connected across the socket.
3. Set the generator to 88 MHz with the output set at 50 µV, FM modulation on and set to 22·5 kHz deviation.
4. Adjust R425 for maximum audio output.

AM Rejection

1. Connect valve voltmeter to either LH or RH loudspeaker socket.
2. Inject 92 MHz, 100 µV FM signal set to 22·5 KHz deviation to FM external aerial socket.
3. Adjust volume control to give a reading of 1 V.
4. Switch generator to AM modulation at 30%, 400 Hz and RF at 92 MHz and note that the output falls by 40 dB.

AFC action

1. Inject 92 MHz signal, FM modulation, 22·5 kHz deviation at 100 µV, and tune to signal. With AFC button out, detune set until output reduces 6 dB, depress AFC button and note the output should rise to original level within 2 dB.
2. Check on both low and high side of tuning point.

Stereo Decoder Oscillator

1. Connect the frequency counter across test pin 412 and earth.
2. Adjust R407 on tuner panel to give a reading of between 18850 and 18950.

Decoder Separation

1. Connect the output of the stereo encoder to the FM aerial socket.
2. Set encoder to a suitable modulation frequency (around 1 kHz), left-hand and right-hand channel; pilot tone on; pre-emphasis in; RF carrier on.
3. Tune receiver to the signal.
4. Connect the oscilloscope and valve voltmeter across left-hand loudspeaker socket.
5. Switch encoder to left-hand modulation only and set amplifier output to 1 V. Stereo beacon lamp should light.
6. Switch encoder to right-hand modulation only and check that the output falls by 40 dB.
7. Repeat test with valve voltmeter and oscilloscope across right-hand loudspeaker socket.
8. Switch off pilot tone and check that stereo beacon lamp goes out.

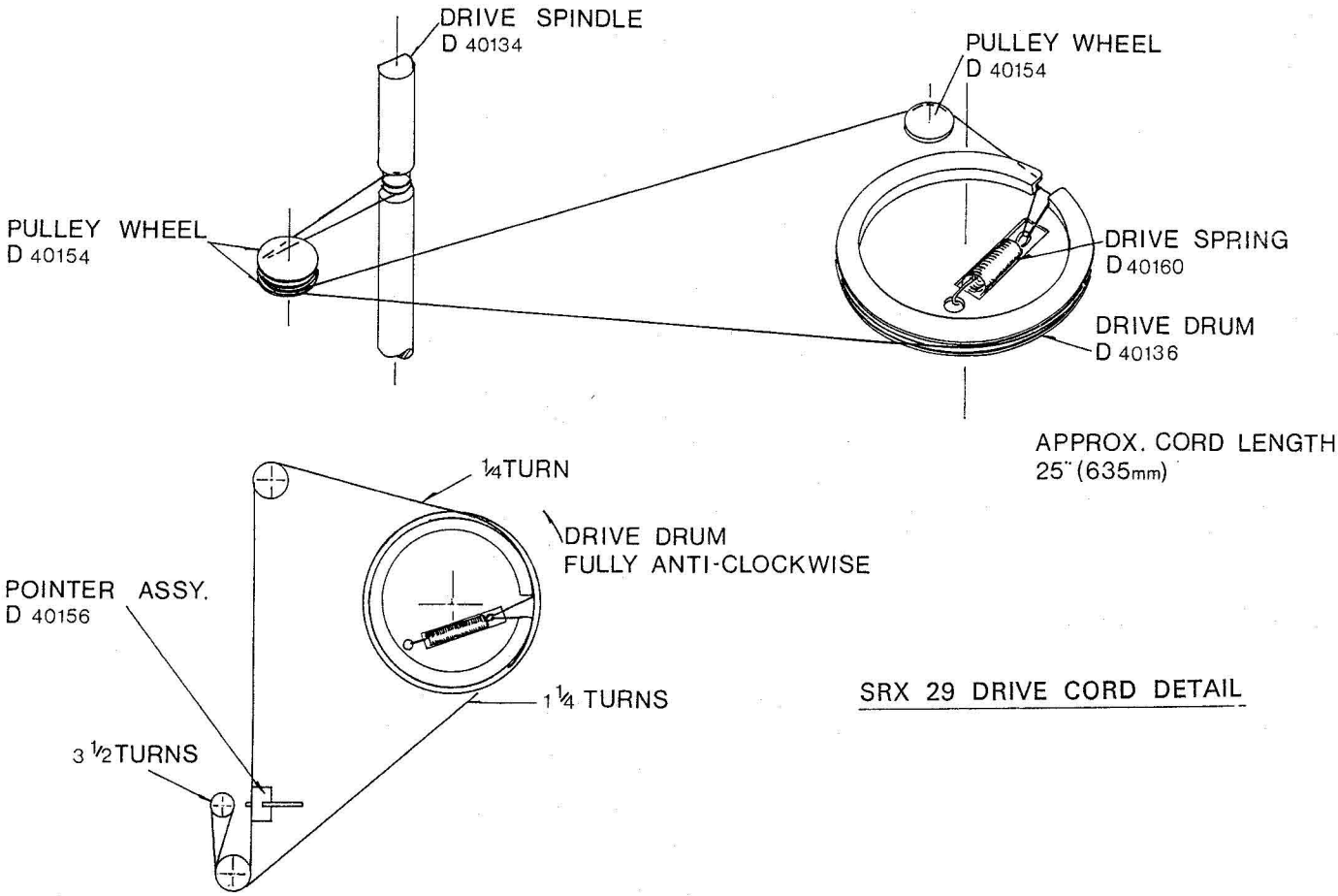

DRIVE SPINDLE
D 40134
PULLEY WHEEL
D 40154
PULLEY WHEEL
D 40154
DRIVE SPRING
D 40160
DRIVE DRUM
D 40136
APPROX. CORD LENGTH
25" (635mm)
¼TURN
DRIVE DRUM
FULLY ANTI-CLOCKWISE
POINTER ASSY.
D 40156
1¼ TURNS
3½TURNS
SRX 29 DRIVE CORD DETAIL

Fig. 12

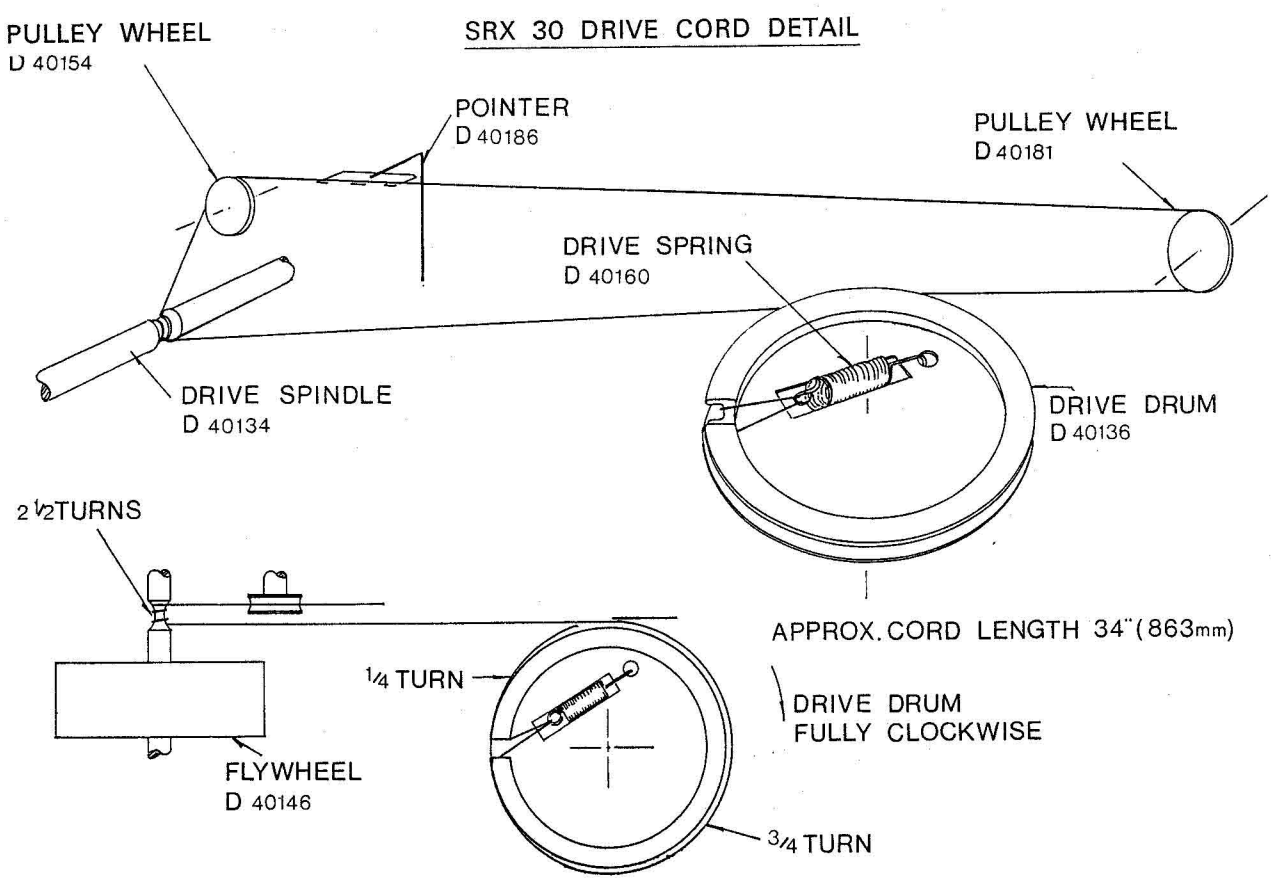
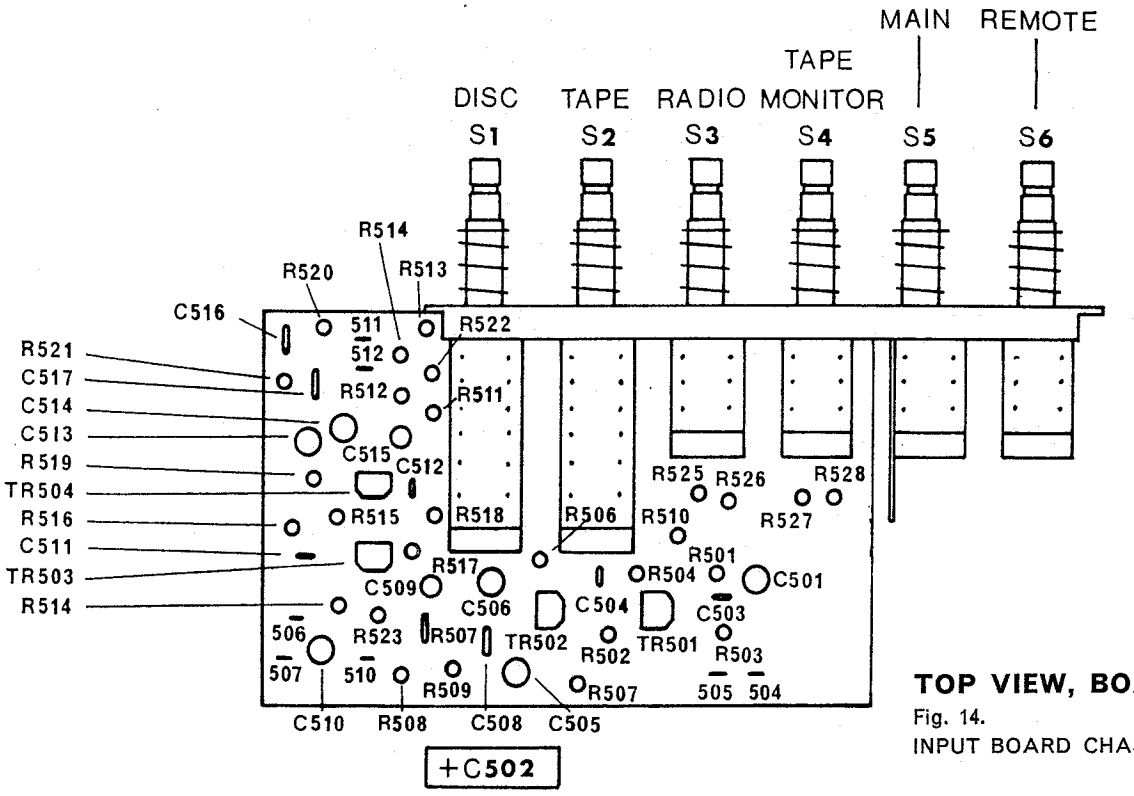
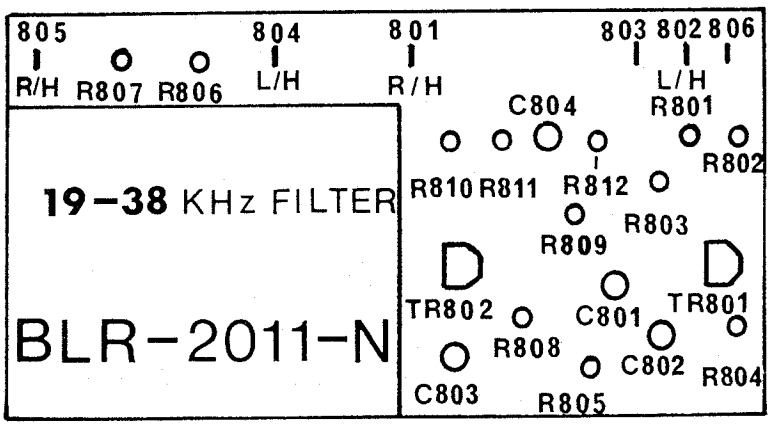

PULLEY WHEEL
D 40154
SRX 30 DRIVE CORD DETAIL
POINTER
D 40186
PULLEY WHEEL
D 40181
DRIVE SPRING
D 40160
DRIVE SPINDLE
D 40134
DRIVE DRUM
D 40136
2½TURNS
APPROX. CORD LENGTH 34" (863mm)
¼ TURN
DRIVE DRUM
FULLY CLOCKWISE
FLYWHEEL
D 40146
¾ TURN

Fig. 13



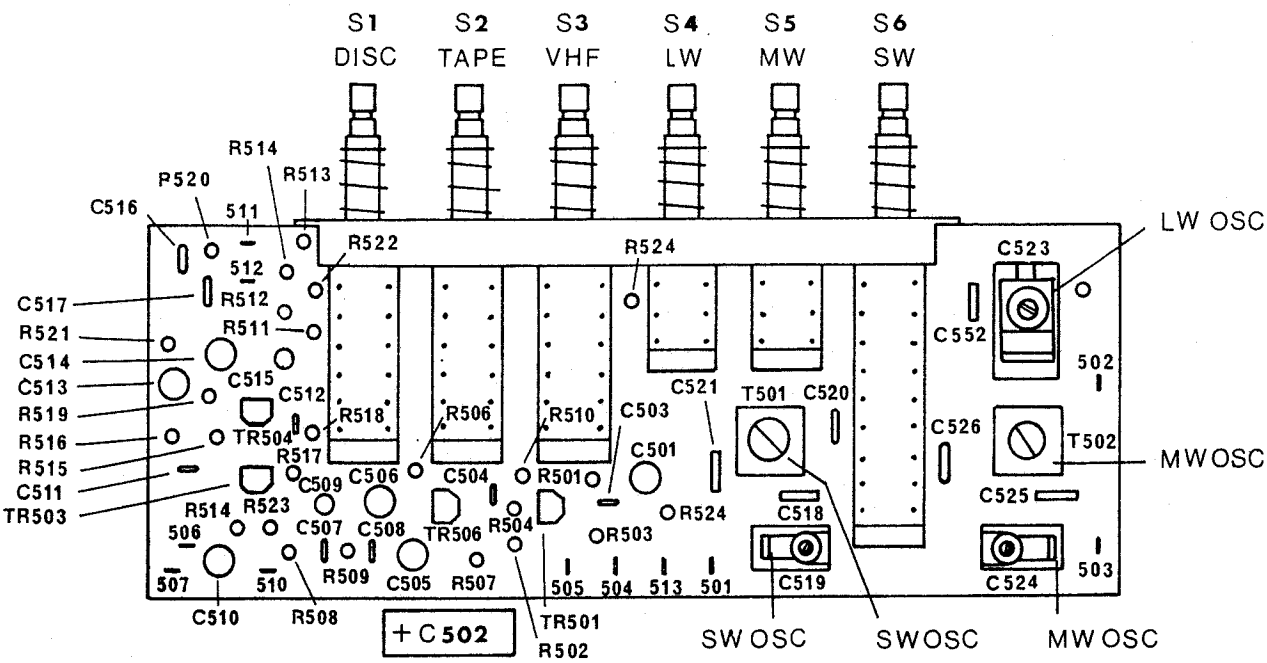
TOP VIEW, BOARD E

Fig. 14.
INPUT BOARD CHASSIS SA29.



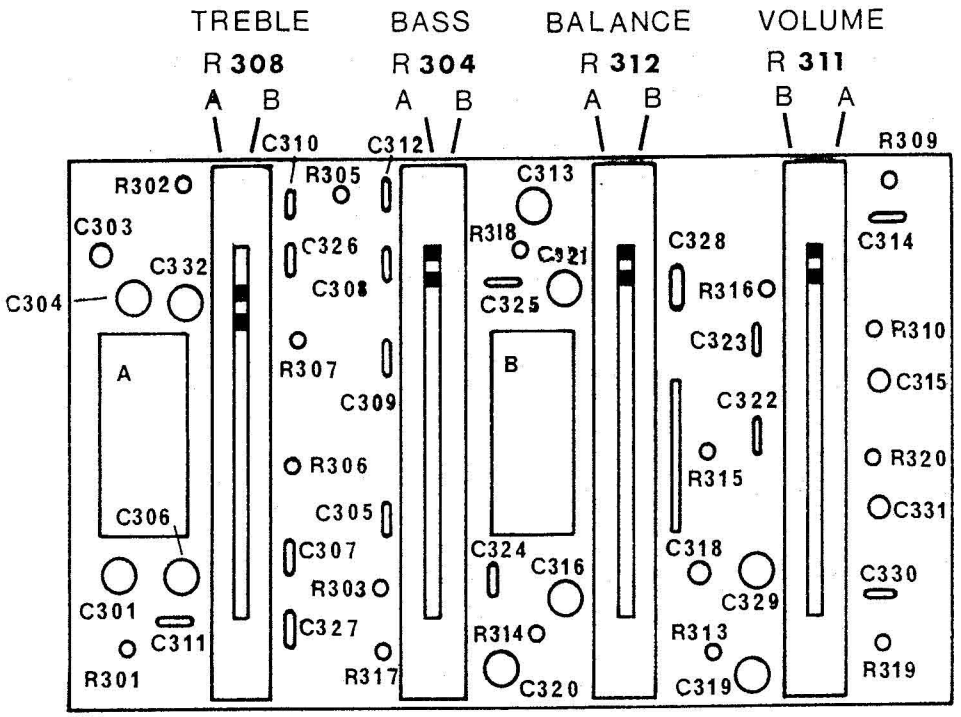
TOP VIEW, BOARD D

Fig. 15. ULTRASONIC FILTER.



TOP VIEW, BOARD B

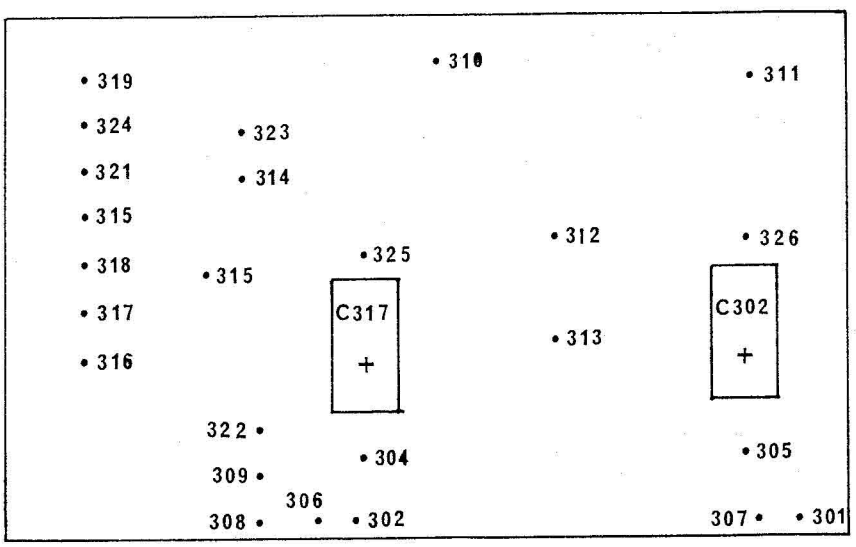
Fig. 16. INPUT BOARD CHASSIS SRX29/SRX30.



TOP VIEW, BOARD C

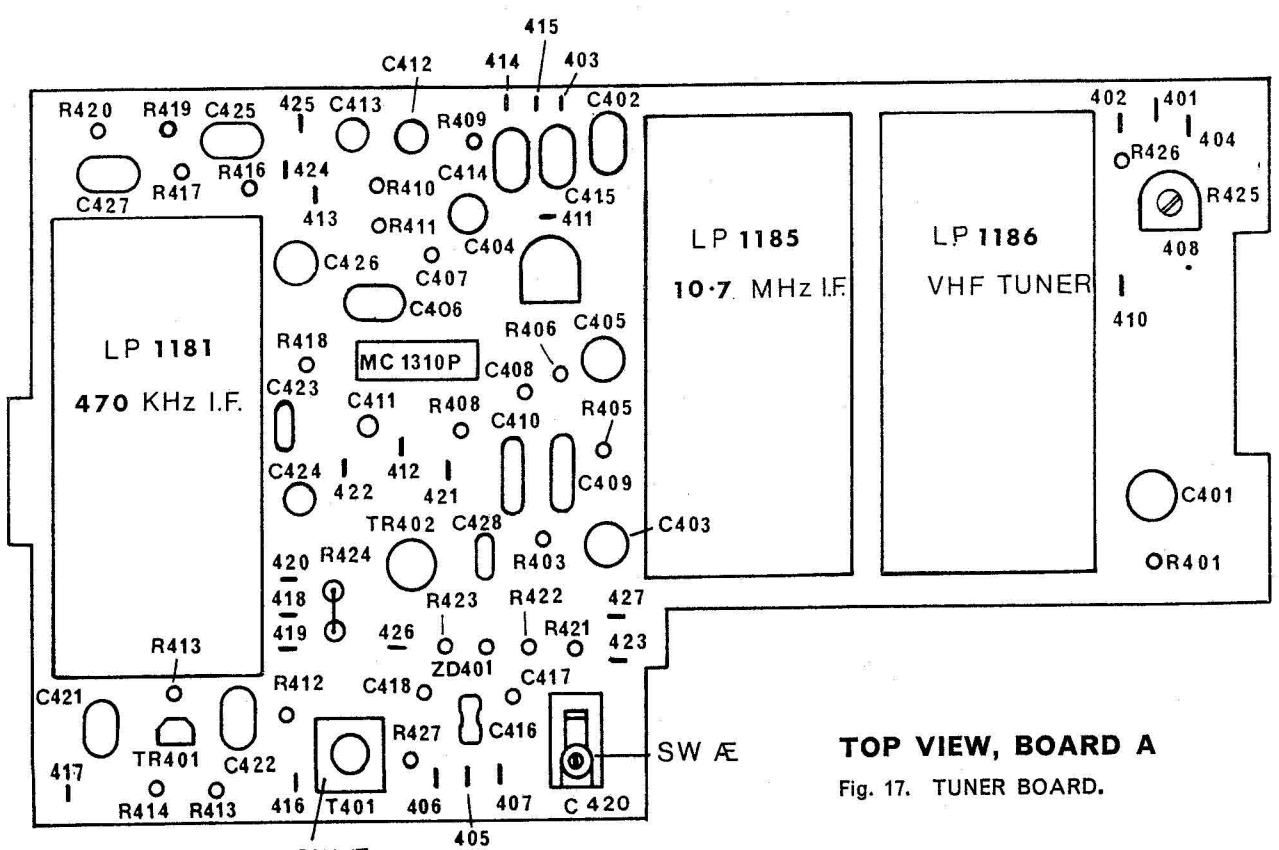
Fig. 15.

TONE CONTROL BOARD.



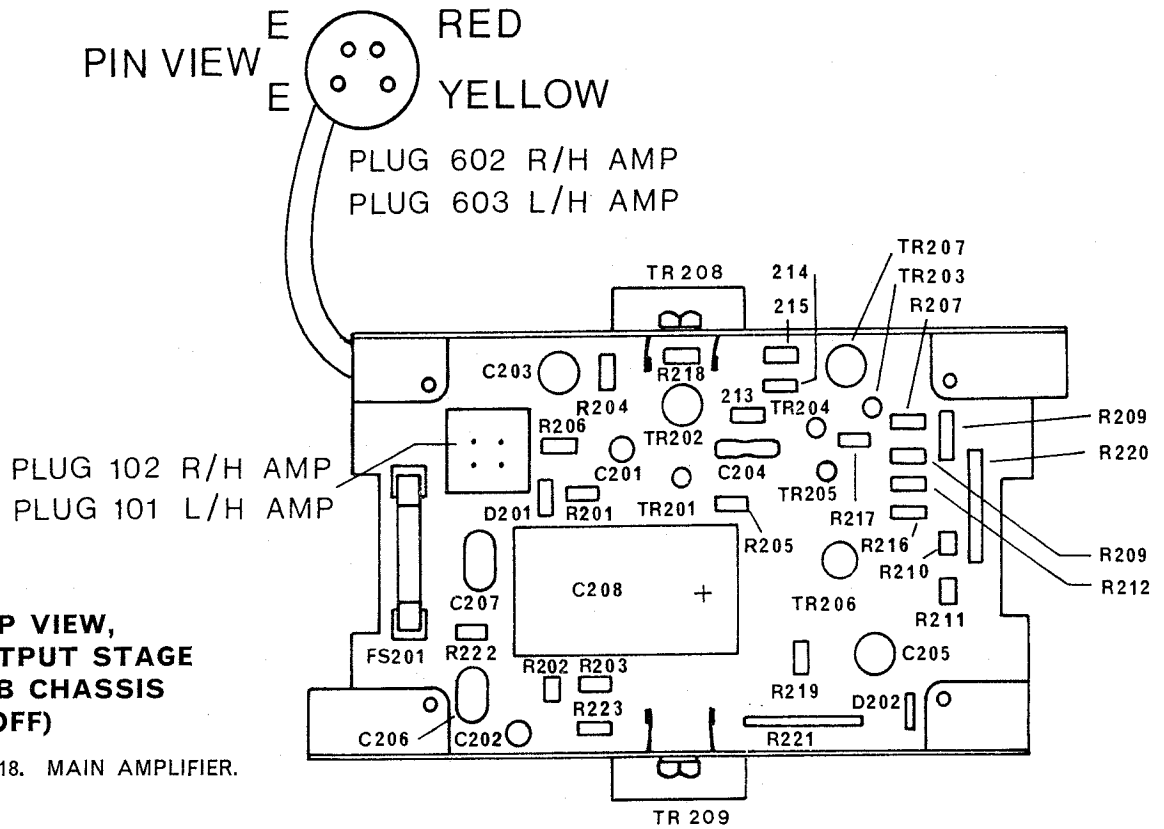
UNDERSIDE VIEW, BOARD C

Fig. 16. TONE CONTROL BOARD.



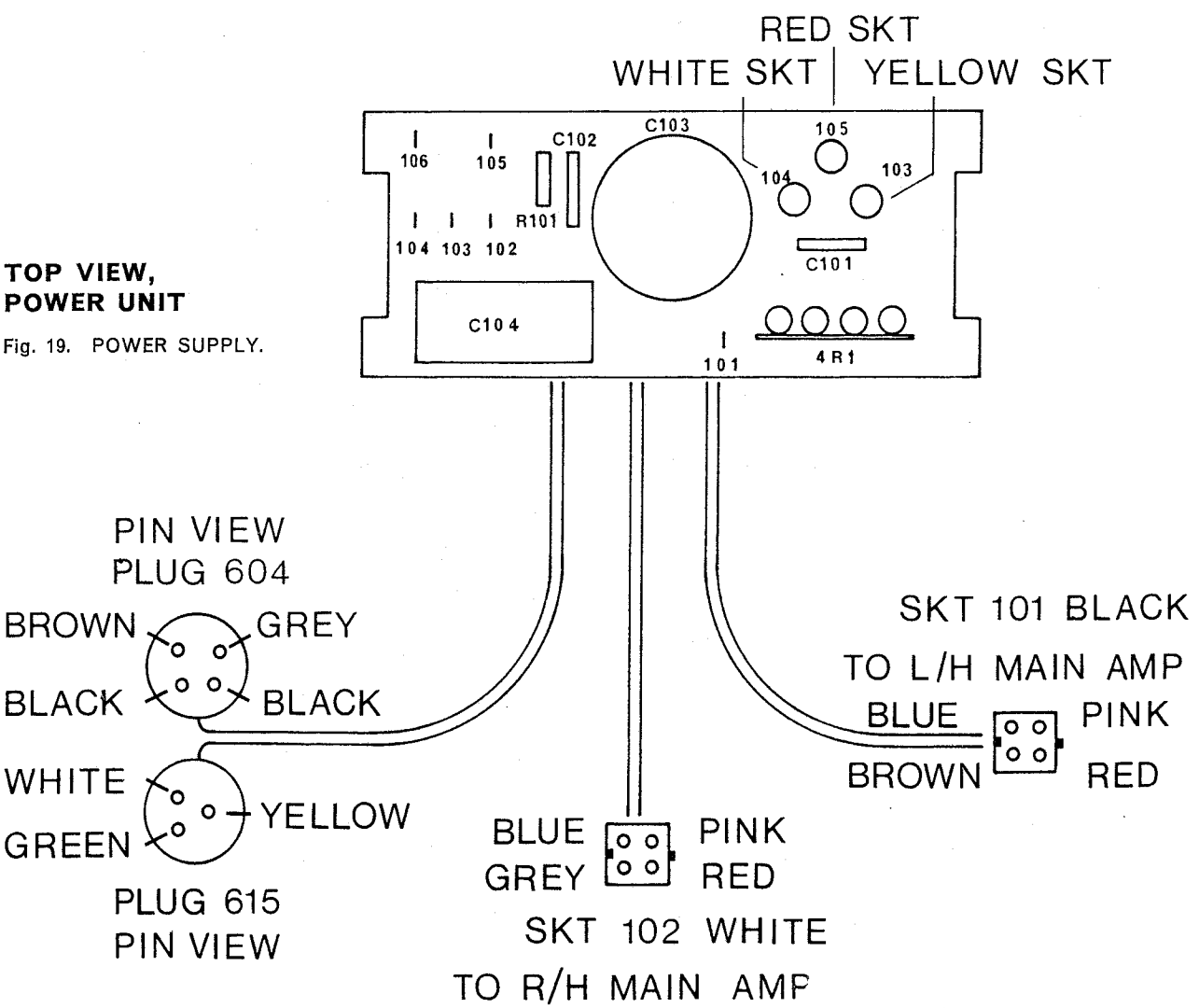
TOP VIEW, BOARD A

Fig. 17. TUNER BOARD.



TOP VIEW, OUTPUT STAGE SUB CHASSIS (2 OFF)

Fig. 18. MAIN AMPLIFIER.



TOP VIEW, POWER UNIT

Fig. 19. POWER SUPPLY.

NOTE 1. Each Chassis has "A" and "B" versions, for example SA29A and SA29B. This suffix letter refers to the length of the control panel fitted to the Particular model, "A" versions having the shorter panels.

NOTE 2. Chassis SA29A is fitted to models: HFC50, HFC51.
Chassis SA29B is fitted to models: HFC 52, HFC 53.
Chassis SRX29A is fitted to models: HFC 54, HFC 55, HFC 62, HFC 63, HFC 65, HFC 66, HFC 67, HFC 68, HFC 69.
Chassis SRX 29B is fitted to models: HFC 56, HFC 57.
Chassis SRX 30A is fitted to models: HFC 58, HFC 59, HFC 64.
Chassis SRX 30B is fitted to models: HFC 60.

ACCESSIBILITY OF CHASSIS AND MODULAR UNITS

In all these models the mains transformer, power unit and main power amplifier modules are inter-connected to the main chassis by plugs and sockets. When exchanging the items always note carefully the positioning of the cables and the points at which they are cleated. Interaction between units may occur if cables are not correctly placed. Note particularly that two mains transformer types are used in this range of models and replacement on a like for like basis should be carefully maintained unless a specific instruction is received from Dynatron Service Department. The thermal fuse fitted to each transformer type is replaceable by withdrawing the active element from its housing. This housing is moulded into the bobbin frame on the "C" core type and taped into position on the toroidal or doughnut type. The element of the fuse is bridged by special low melting point metal and must not be repaired using ordinary solder. Always fit a replacement element. When replacing a toroidal transformer do not tighten the fixing screw more than is required to prevent the transformer rotating. Over-tightening can cause vibration to be transmitted to the cabinet work and could give rise to hum. Secure the screw with a dab of cellulose paint. Replacement of power unit or main power amplifier modules is simply a matter of unplugging the various cables, releasing the springy tongue of the mounting clip moulding, and lifting out the circuit board complete. Replacement is in reverse order but note that the notches in the ends of the circuit boards are of unequal size to mate with the mounting clip.

TO GAIN ACCESS TO THE CHASSIS AND MODULES PROCEED AS FOLLOWS:

Models HFC 50, 51, 52, 53, 54, 55, 56, 57

First secure the pick-up arm to its rest (and in the case of the GL78 Record Player lift off the heavy turntable) close the plastics lid and invert the unit onto a soft surface. Remove the base fixing screws and remove base. The chassis is removed as follows:

Release all plugs to modules and pull off the mains lead connectors from the transformer. Disconnect player unit plugs from chassis. Locate 3 × 4BA nuts securing chassis over studs. Remove these nuts and associated washers and carefully lift chassis clear of cabinet. Replace in reverse order.

Models HFC 62, 63, 65

Secure pick-up arm and invert cabinet. Remove base board and proceed as for HFC 50.

Model HFC 66, 67

Proceed as for HFC 62 but note that it is not necessary to remove loudspeaker housing base panels unless access to the loudspeakers is required. When replacing the connecting plugs for the internal loudspeakers, ensure that they are inserted into the loudspeaker sockets marked "MAIN" and give correct Left and Right hand sensing.

Models HFC 58, 59 and 64

Secure the pick-up arm to its rest and in the case of the GL78 lift off the turntable. Release screws securing the motor board and lift the board sufficiently to enable the pick-up cartridge plug and motor plug to be removed from rear of chassis. Lift the motor board clear of cabinet to give access to chassis and modules etc. To remove chassis, first disconnect all plugs and sockets from modules and mains connecting lead to transformer then release 2 × 2BA screws securing chassis to cabinet floor. These screws are located (1) adjacent to rear of socket 605 and (2) adjacent to socket 609. Also release the screws tensioning the chassis straps located at each end of the chassis. For complete withdrawal of chassis release the rear mounted sockets panel (2×4BA nuts) and draw chassis complete through front of cabinet.

Model HFC 60

Secure pick-up arm to rest and release screws (6 off) securing motor board to cabinet. Lift motor board sufficiently to enable the pick-up cartridge and motor plugs and the tape recorder signal and power plugs to be withdrawn from rear of chassis. Lift motor board clear to give access to chassis and modules etc. To remove chassis from cabinet proceed as for HFC 58.

The tape recorder unit may be removed from the motor board as follows. Locate and release the long screws passing through the top moulding of the unit and motor board, then lift the rear of the unit sufficiently to clear the motor board and, moving the unit slightly rearwards to clear the front locating brackets, lift the unit up and clear.

Models HFC 68, 69

Proceed as for HFC 62 for access to chassis and modules. When removing the chassis it will be necessary to disconnect the tape recorder signal and power supply plugs from their sockets on the chassis in addition to the other plugs.

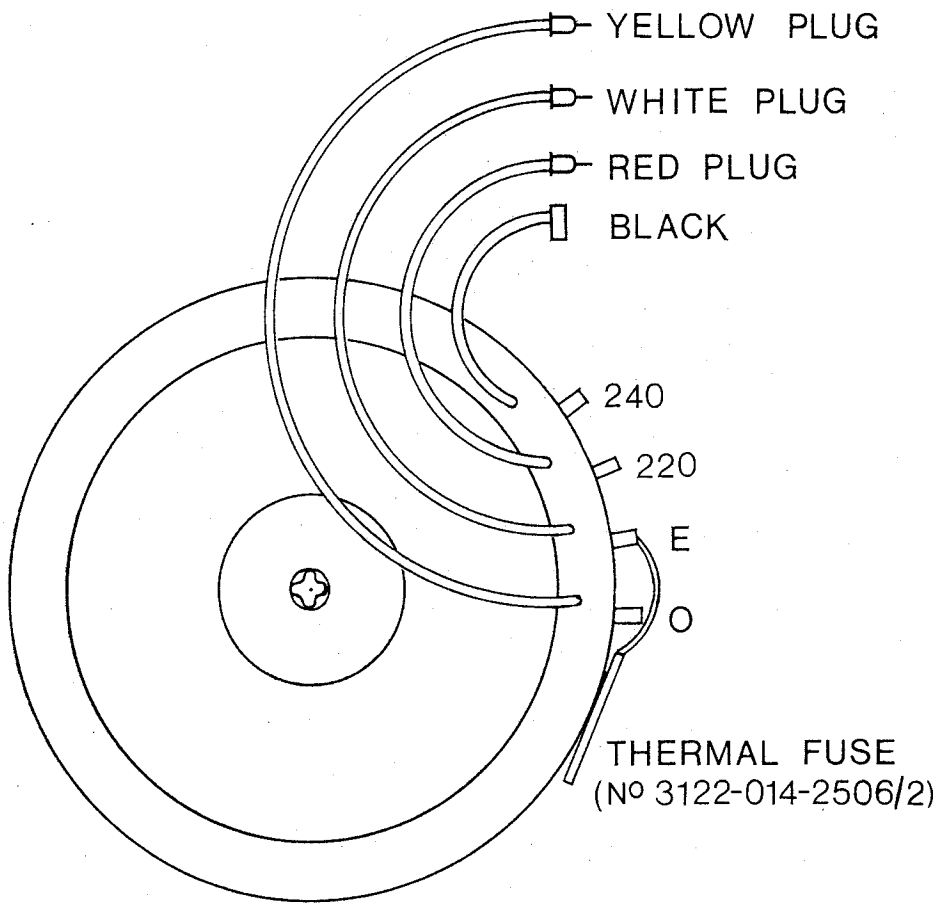
For access to the tape recorder unit mechanism, place cabinet on its back and open lid flat to bench. Locate 2 fixing screws passing through fixed part of cabinet base to secure the tape unit carrier. Steady the tape unit and release the fixing screws.

Full withdrawal of the tape unit requires the release of signal and power cable plugs from the main chassis. Removal of the tape recorder from the carrier is carried out in the same manner as for HFC 60.

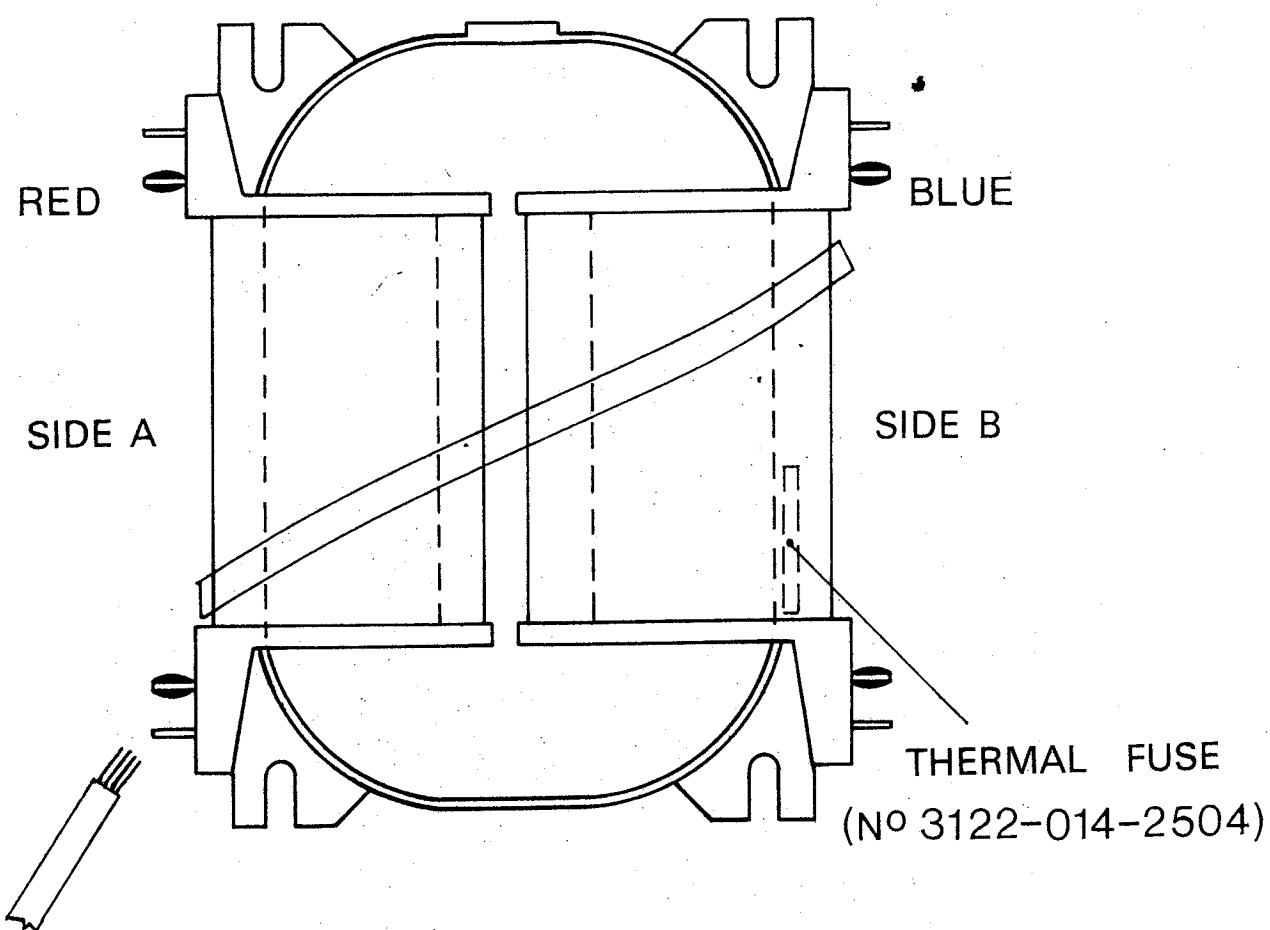
Note: The Goldring 101 and Garrard 6-300 player units are removed in the conventional manner by placing the transit screw clips in a vertical position so that they will pass through the holes in the motor board. When handling the G101 take care not to introduce any grease onto the driving belt.

In the case of the GL78 units it is necessary to release the 4 nuts from the mounting studs to allow the unit to be withdrawn from its mounting spring assemblies. When replacing a GL78 unit, care must be taken to seal the nuts to the studs using a dab of cellulose paint and to replace any rubber sleeves over the studs. Should a stud come loose from the motor plate, first coat the thread with a small quantity of cellulose paint and then enter the stud fully into the motor plate bush. Tighten the lock nut and seal with paint.

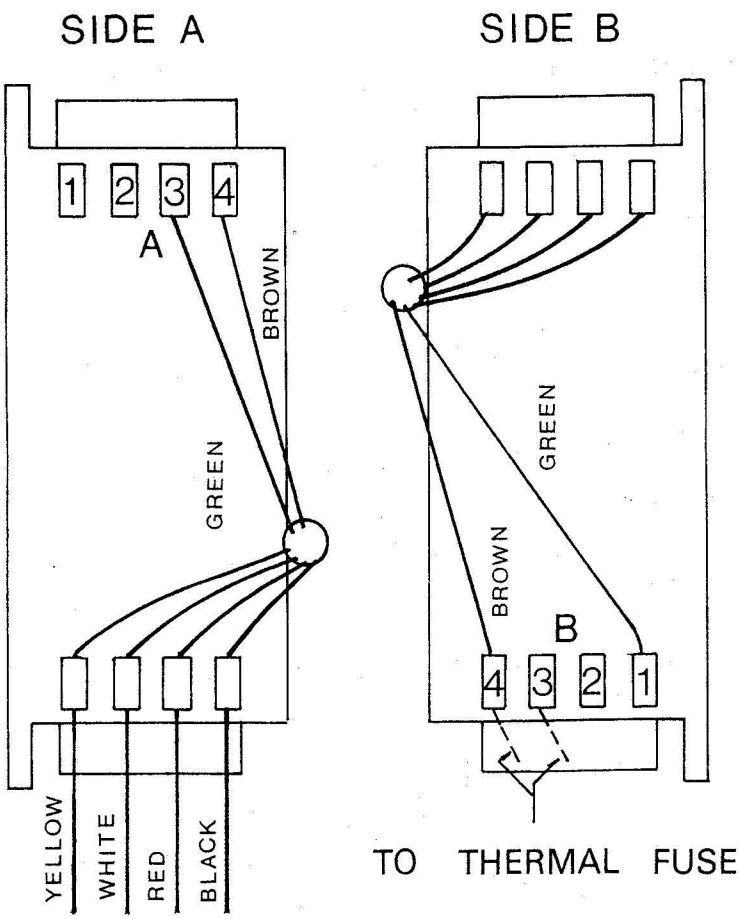
Always check that the motor transit screws are released fully when the equipment is installed with the customer or there may be complaints of "rumble" or "motor noise".



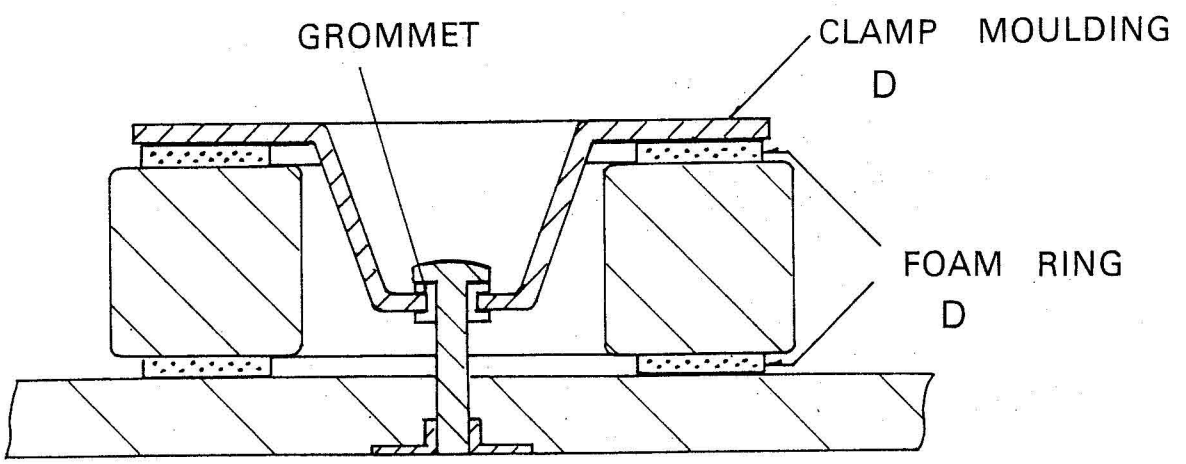
TOROIDAL MAINS TRANSFORMER T701



'C' CORE MAINS TRANSFORMER



'C' CORE MAINS TRANSFORMER (SIDE VIEWS)



NOTE: FIXING SCREWS SHOULD ONLY BE TIGHTENED SUFFICIENTLY TO PREVENT TRANSFORMER ROTATING.

TOROIDAL MAINS TRANSFORMER T701 (SECTIONAL SIDE VIEW)

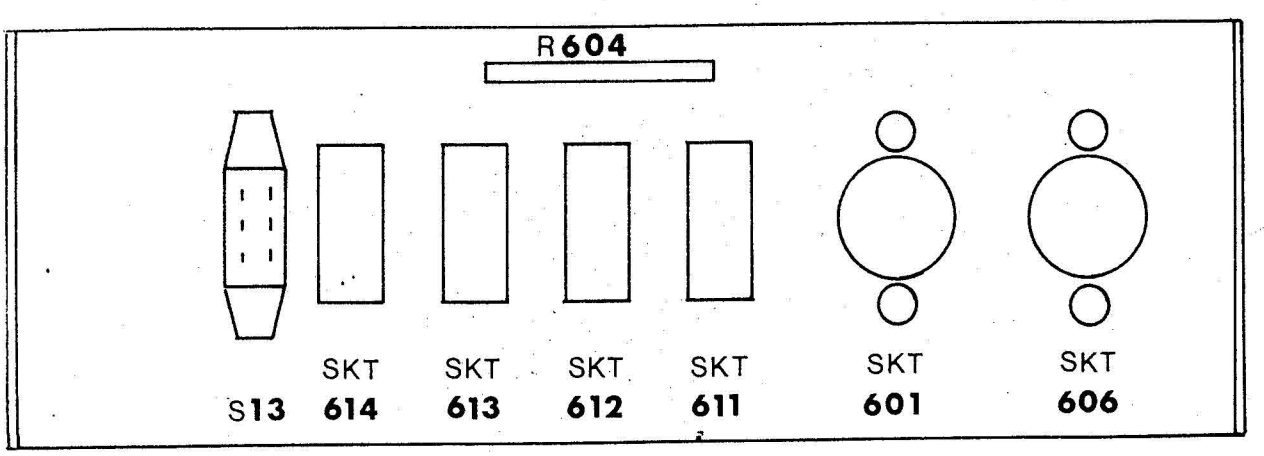
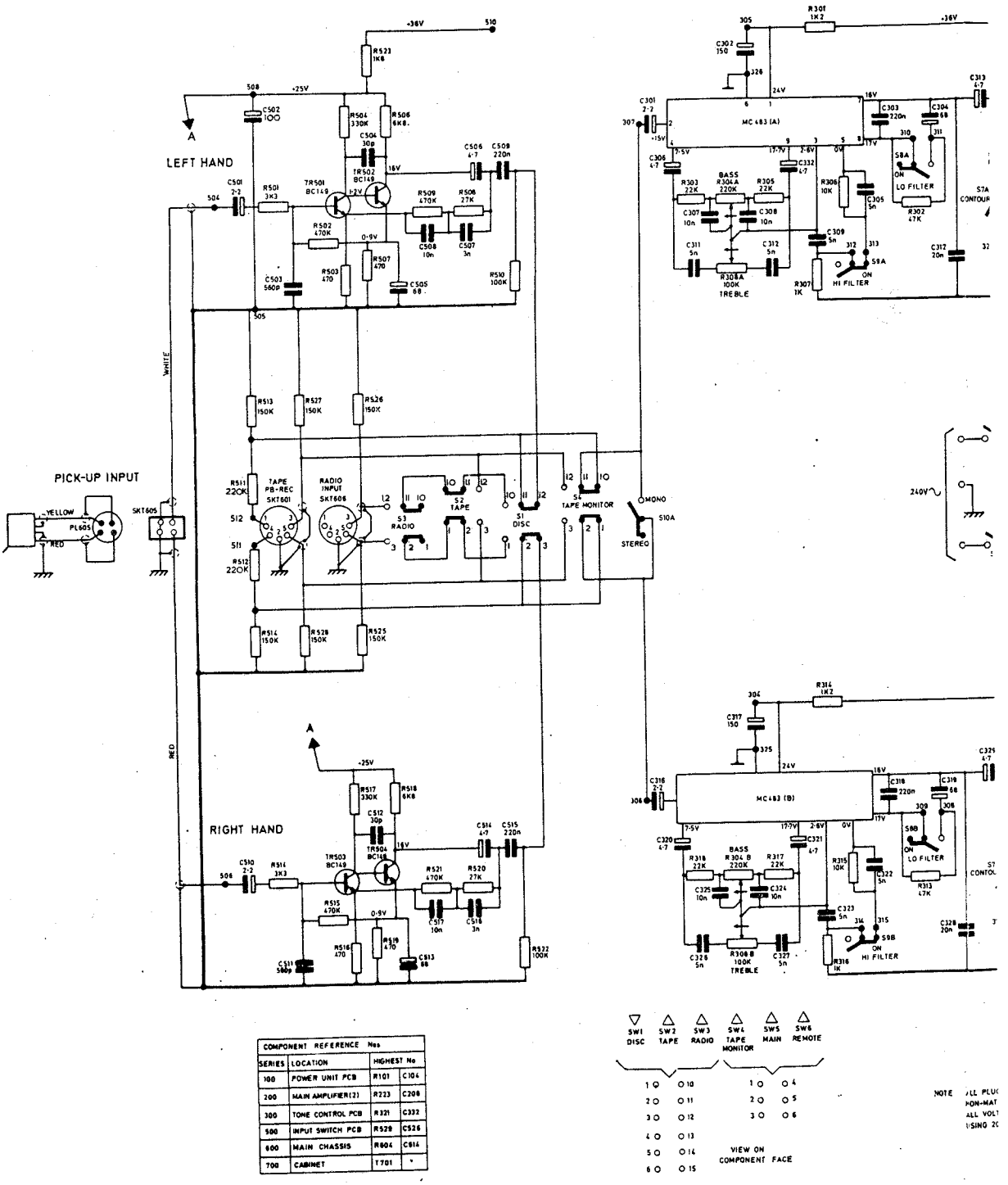


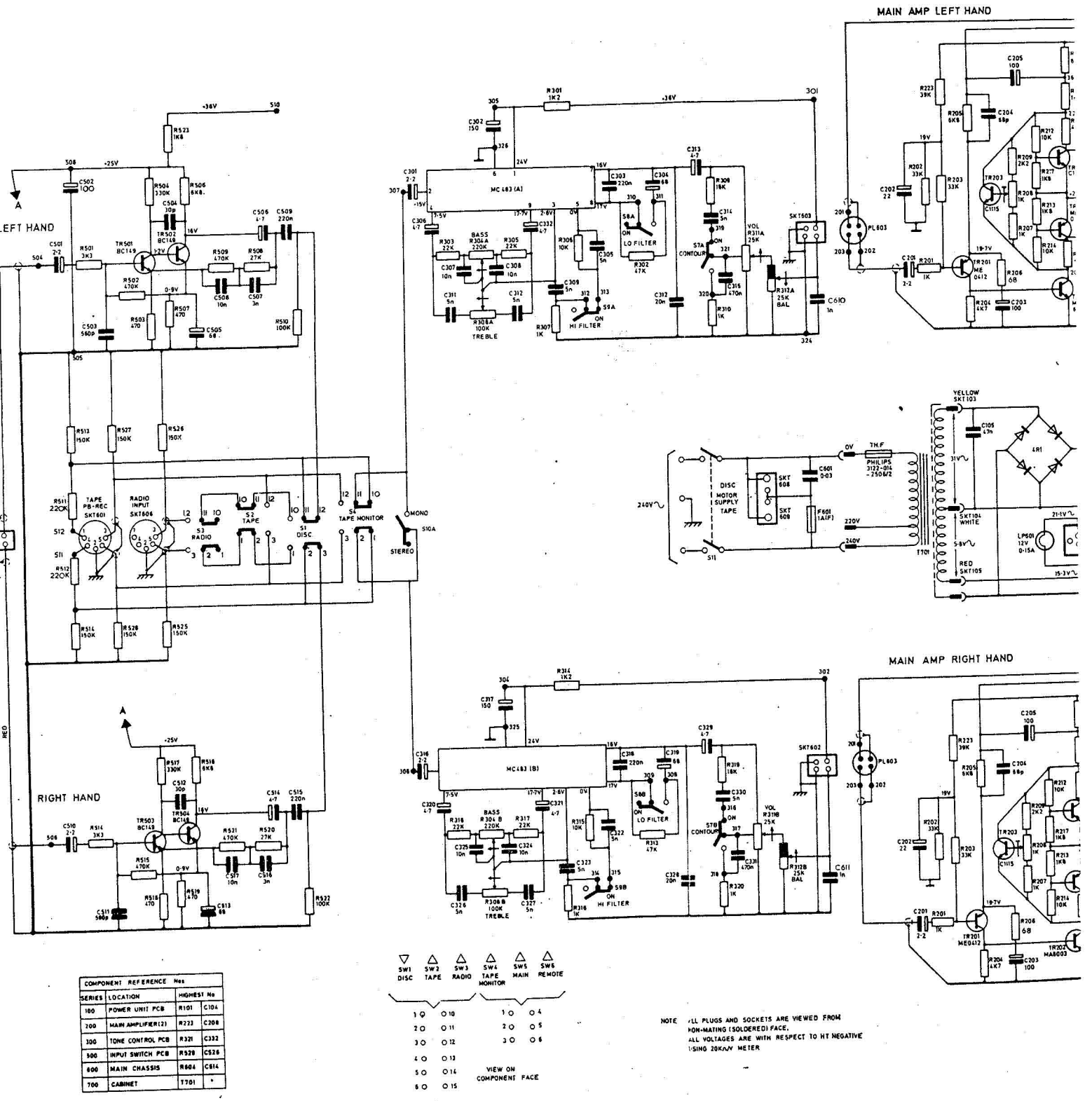
Fig. 20. SOCKETS PANEL, CHASSIS SA29 (INSIDE VIEW).



COMPONENT REFERENCE Nos			
SERIES	LOCATION	HIGHEST No	
100	POWER UNIT PCB	R101	C104
200	MAIN AMPLIFIER(2)	R233	C208
300	TONE CONTROL PCB	R321	C332
500	INPUT SWITCH PCB	R528	C526
600	MAIN CHASSIS	R604	C614
700	CABINET	1701	*

Fig. 2

CIRCUIT DIAGRAM SA29

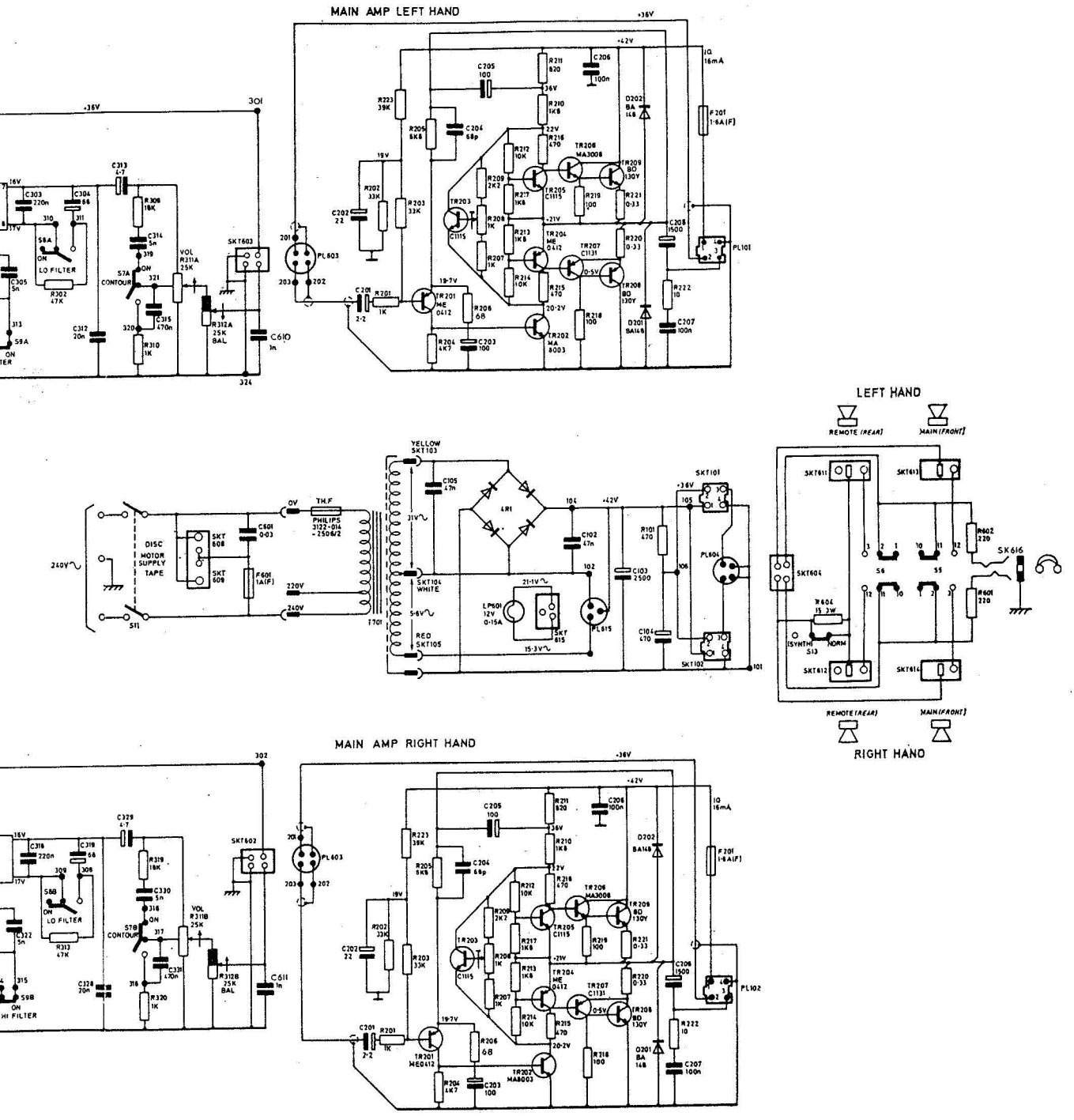


COMPONENT REFERENCE Nos			
SERIES	LOCATION	HIGHEST No	
100	POWER UNIT PCB	R101	C104
200	MAIN AMPLIFIER(2)	R223	C208
300	TONE CONTROL PCB	R321	C332
500	INPUT SWITCH PCB	R528	CS26
600	MAIN CHASSIS	R604	C614
700	CABINET	T701	*

NOTE ALL PLUGS AND SOCKETS ARE VIEWED FROM NON-MATING (SOLDERED) FACE.
ALL VOLTAGES ARE WITH RESPECT TO HT NEGATIVE
USING 20KΩ/V METER

Fig. 21

RCUIT DIAGRAM SA29



NOTE ALL PLUGS AND SOCKETS ARE VIEWED FROM NON-MATING (SOLDERED) FACE.
ALL VOLTAGES ARE WITH RESPECT TO HT NEGATIVE
USING 20KΩ/V METER

Fig. 21

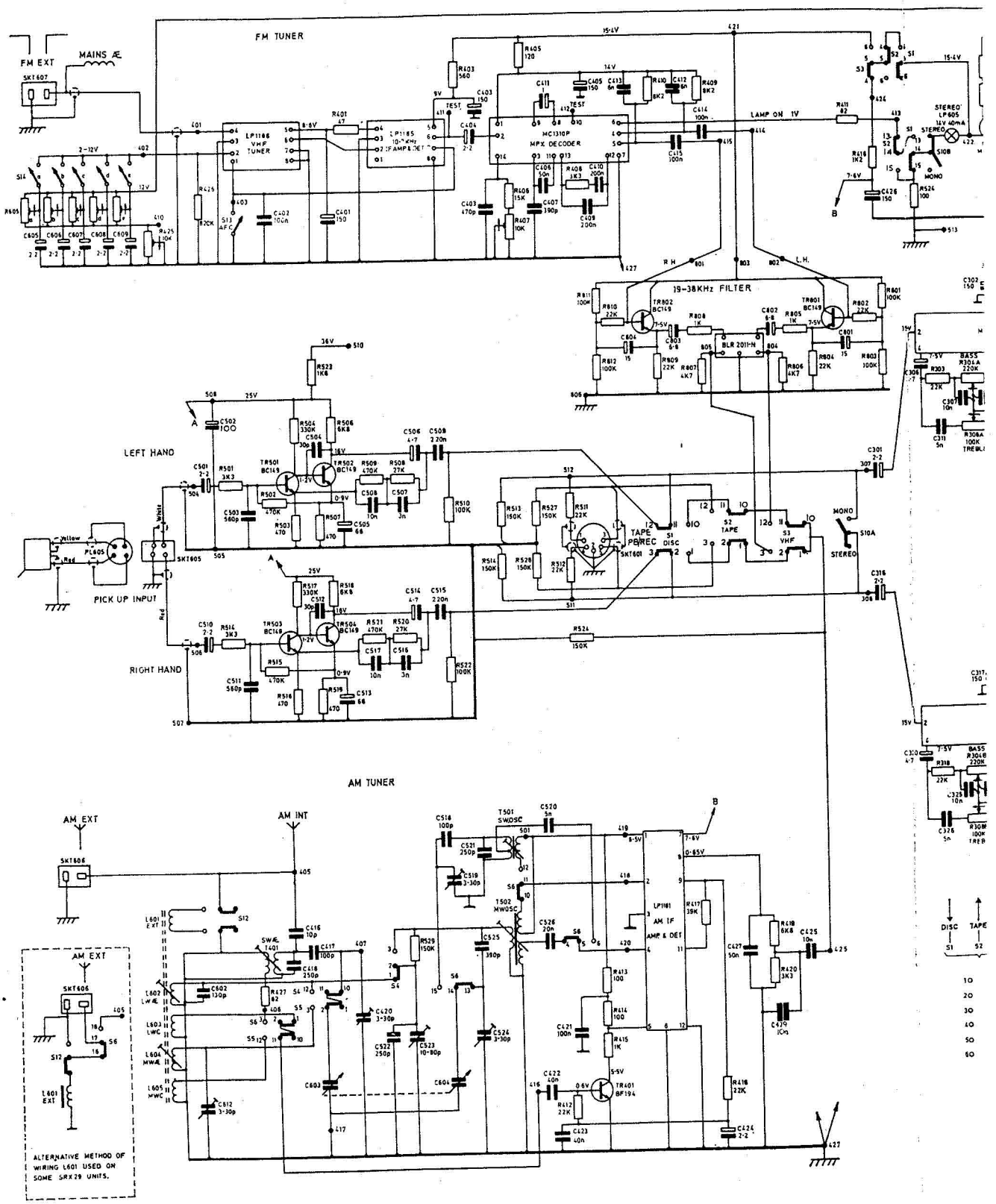
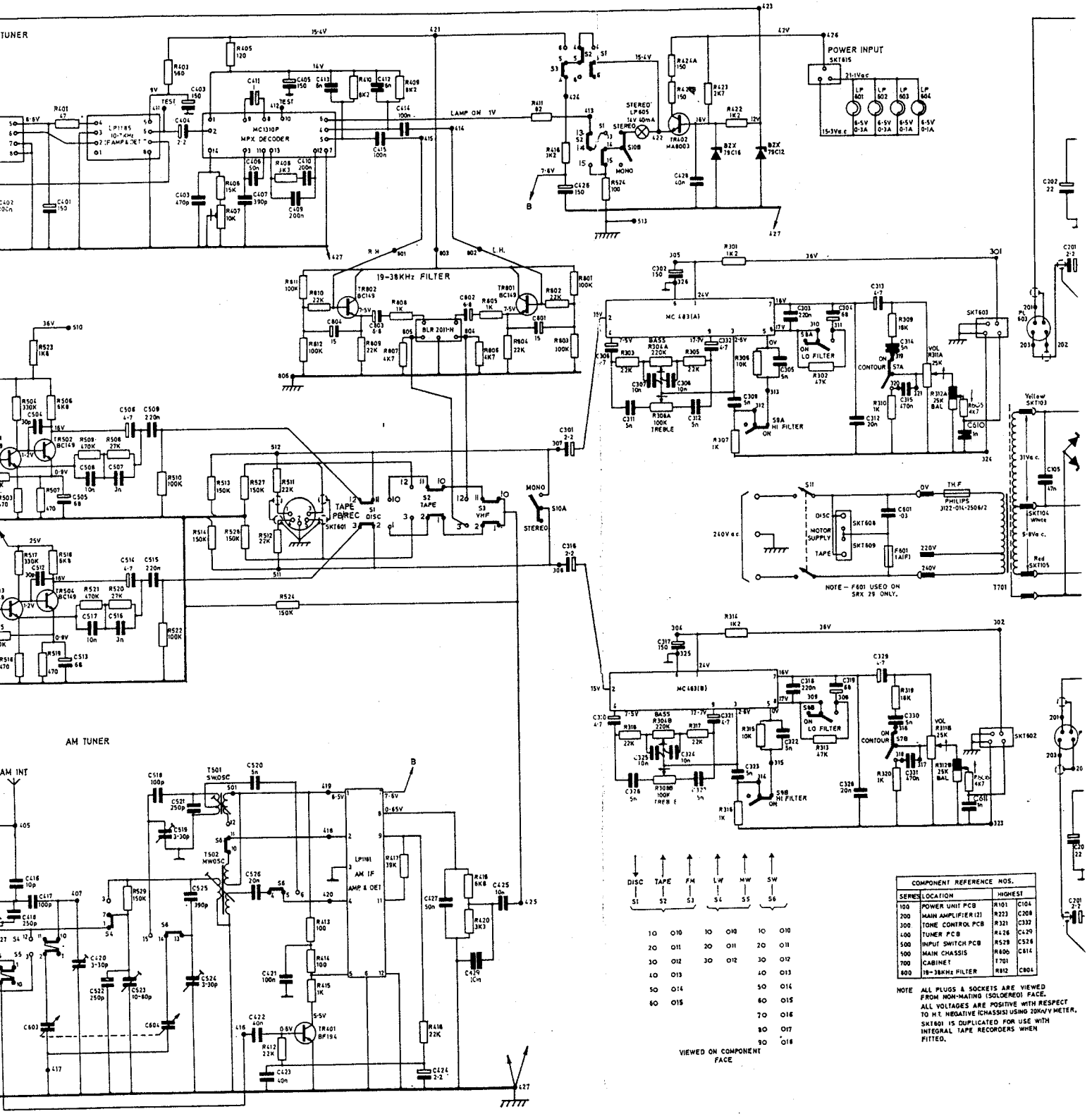

FM TUNER
FM EXT
MAINS Æ
SKT607
LP1186 VHF TUNER
MC1310P MPX DECODER
LAMP ON 1V
STEREO LP605
19-38KHz FILTER
LEFT HAND
RIGHT HAND
PICK UP INPUT
PL605
SKT605
TAPE REC
TAPE PB
DISC
VHF
MONO
STEREO
AM TUNER
AM EXT
AM INT
SKT606
SWÆ T401
T501 SWOSC
T502 MWOSC
LP1181 AM IF AMP & DET
TR401 BF194
ALTERNATIVE METHOD OF WIRING L601 USED ON SOME SRX29 UNITS.

Fig. 22

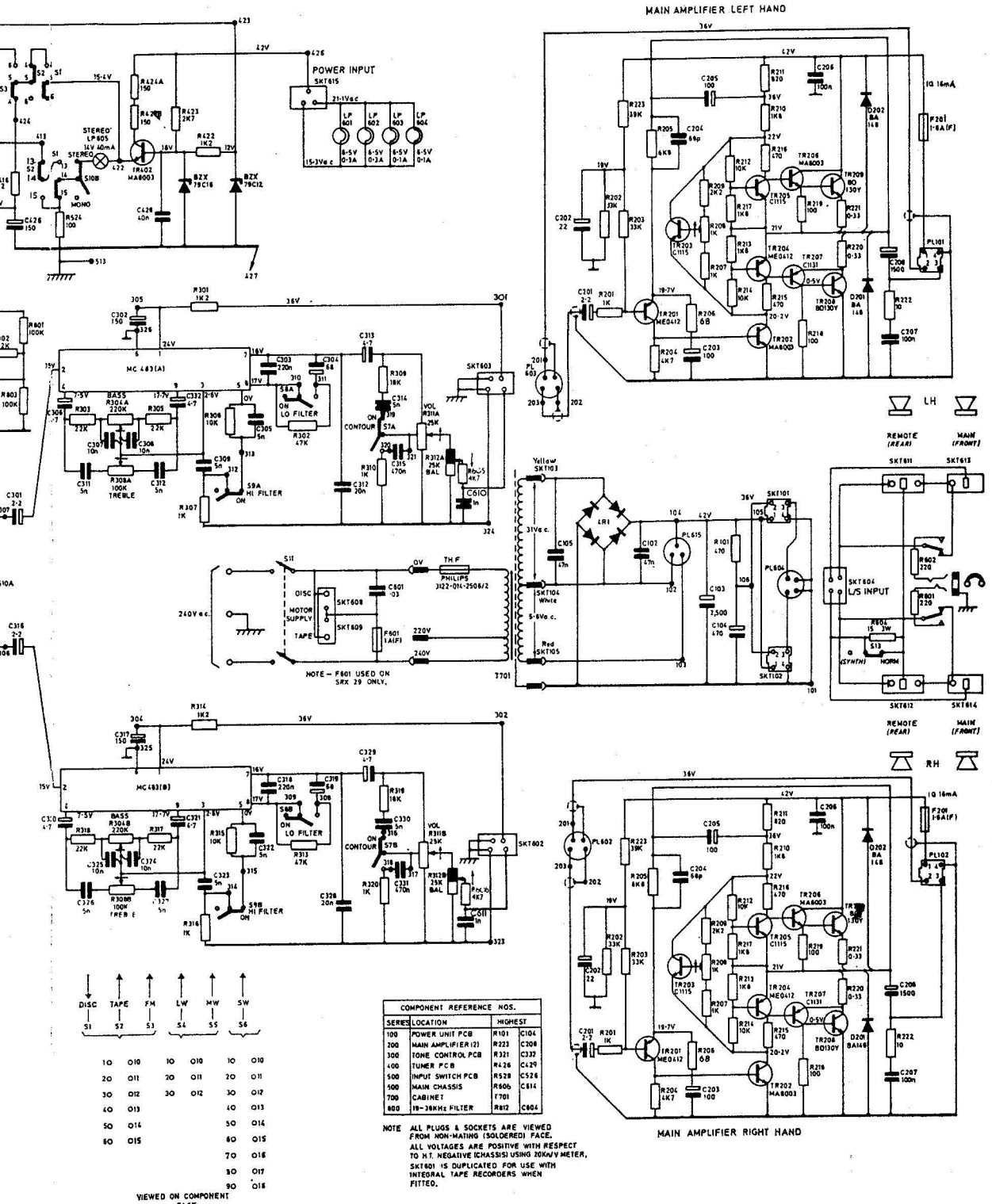
CIRCUIT DIAGRAM, CHASSIS SRX29/SRX30



COMPONENT REFERENCE NOS.			
SERIES	LOCATION	HIGHEST	
100	POWER UNIT PCB	R101	C104
200	MAIN AMPLIFIER (2)	R223	C208
300	TONE CONTROL PCB	R321	C332
400	TUNER PCB	R426	C429
500	INPUT SWITCH PCB	R528	C526
500	MAIN CHASSIS	R606	C614
700	CABINET	T701	
800	19-38KHz FILTER	R812	C804

NOTE ALL PLUGS & SOCKETS ARE VIEWED FROM NON-MATING (SOLDERED) FACE.
ALL VOLTAGES ARE POSITIVE WITH RESPECT TO H.T. NEGATIVE (CHASSIS) USING 20KΩ/V METER.
SKT801 IS DUPLICATED FOR USE WITH INTEGRAL TAPE RECORDERS WHEN FITTED.

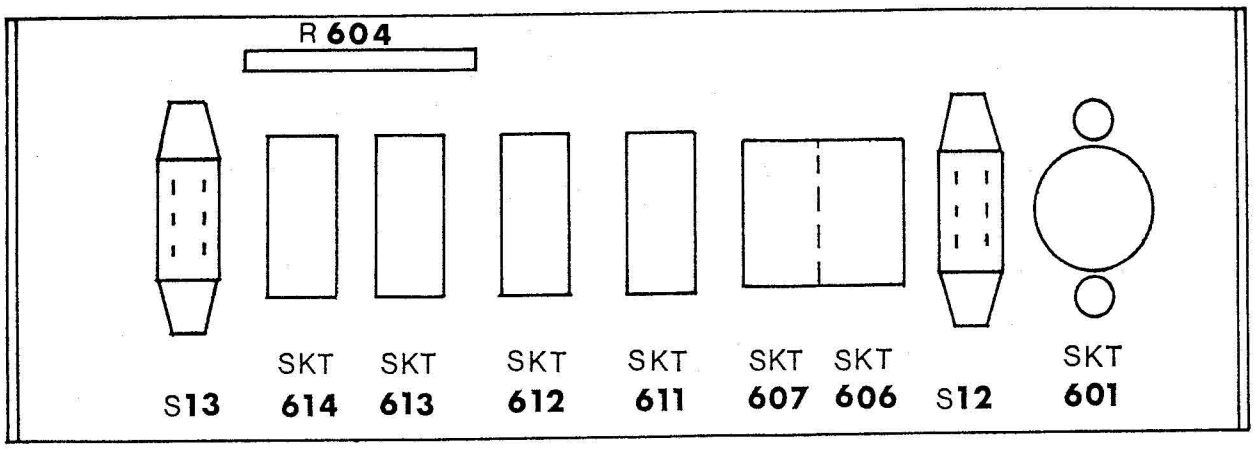
Fig. 12



COMPONENT REFERENCE NOS.			
SERIES	LOCATION	HIGHEST	
100	POWER UNIT PCB	R101	C104
200	MAIN AMPLIFIER (2)	R223	C208
300	TONE CONTROL PCB	R321	C332
400	TUNER PCB	R426	C429
500	INPUT SWITCH PCB	R529	C526
600	MAIN CHASSIS	R606	C614
700	CABINET	T701	
800	19–36KHz FILTER	R812	C804

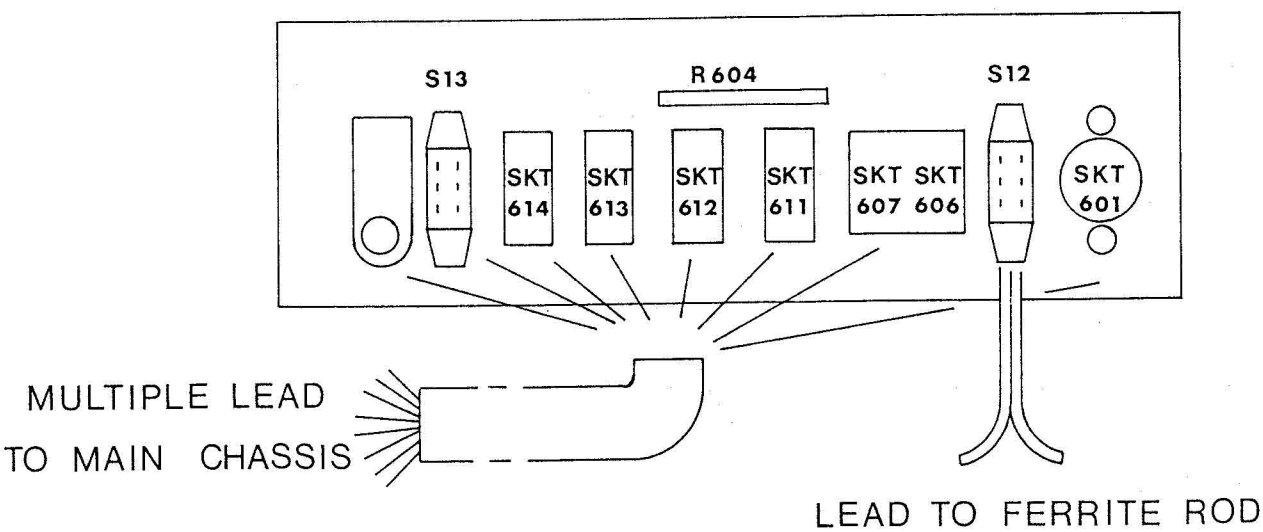
NOTE ALL PLUGS & SOCKETS ARE VIEWED FROM NON-MATING (SOLDERED) FACE.
ALL VOLTAGES ARE POSITIVE WITH RESPECT TO H.T. NEGATIVE (CHASSIS) USING 20Kn/V METER.
SKT601 IS DUPLICATED FOR USE WITH INTEGRAL TAPE RECORDERS WHEN FITTED.

Fig. 22



SOCKETS PANEL, MODELS SRX29 (INSIDE VIEW)

Fig. 23.



SOCKETS PANEL, MODELS SRX30 (INSIDE VIEW)

Fig. 24.

Audio Amplifier Section

The circuit diagram shows the complete circuit and is drawn so that the various sections are clearly identified.

P.U. signals are amplified by TR 501–504 which also provide frequency response correction (RIAA) for magnetic cartridges, the resulting signal then passes through to the input selector switch bank (S1, S2, S3). Signals from other sources, i.e. Tape and Radio, are also fed into these switches which enable the desired signal to be channeled into the tone control stage. This consists of two "Thick Film" units (MC 483 A & B) which each contain: an emitter follower, followed by a voltage amplifier, followed by a second emitter follower; a Baxandall type feedback tone control circuit is connected to the voltage amplifier which also provides a phase-shift type scratch filter. The second emitter follower has "boot-strapping" from its emitter to its base. This network is switchable and provides a steep-slope rumble filter giving sharp attenuation below 40Hz. Volume and balance controls follow on to control signal levels into the main amplifiers. These consist of D.C. coupled amplifiers TR 201–209; TR 201 and TR 202 provide voltage gain and work in class "A" conditions. TR 203 is part of the collector load for TR 202 and controls the forward bias for the class "B" driver and output transistors. TR 206 and TR 207 are a complementary driver pair directly coupled to the output transistors, TR 208 and TR 209, which are mounted on independent heat sinks without any electrical insulation washers to ensure best possible heat transfer. The output voltage is divided by R 205 and R 206 and applied to the emitter of TR 201 as negative feedback, controlling voltage gain and distortion over the main amplifier section.

Overload signal protection is provided by TR 204 and TR 205 whose action is to short circuit large signal currents from the driver stage, thus preventing the output transistors from being over-driven.

The power supply to drive the complete equipment employs either a toroidal or a "C" core type mains transformer fitted with a thermal fuse in its primary winding and a bridge rectifier, feeding a single reservoir capacitor, connected to its secondary. The indicator lamps are connected to a tap on the secondary winding and must not, therefore, be grounded otherwise the rectifier would be short circuited. The D.C. supply to each main amplifier is protected by a 1·6 amp fuse.

Synthesized four-channel facilities are provided by connecting the rear speakers across the "live" terminals of the left and right hand main amplifiers, with an additional earth path through R604 to maintain a measure of L–R separation.

SRX 29–SRX 30 Receiver sections

The AM and FM tuner sections are quite separate; consider first the **AM section:**

The two-section tuning gang tunes simultaneously the local oscillator and selected aerial coil, aerial signal current is picked up by mutual coupling to the tuned coil and fed into a RF amplifier/AGC stage TR 401 whose output feeds the local oscillator-mixer input to generate an IF of 470kHz. All IF filtering is provided by R 419, R 420, C 427 and C 429. Audio signals are fed from the detector and filter to the amplifier input selector switch bank (S1, S2, S3).

VHF/FM Section

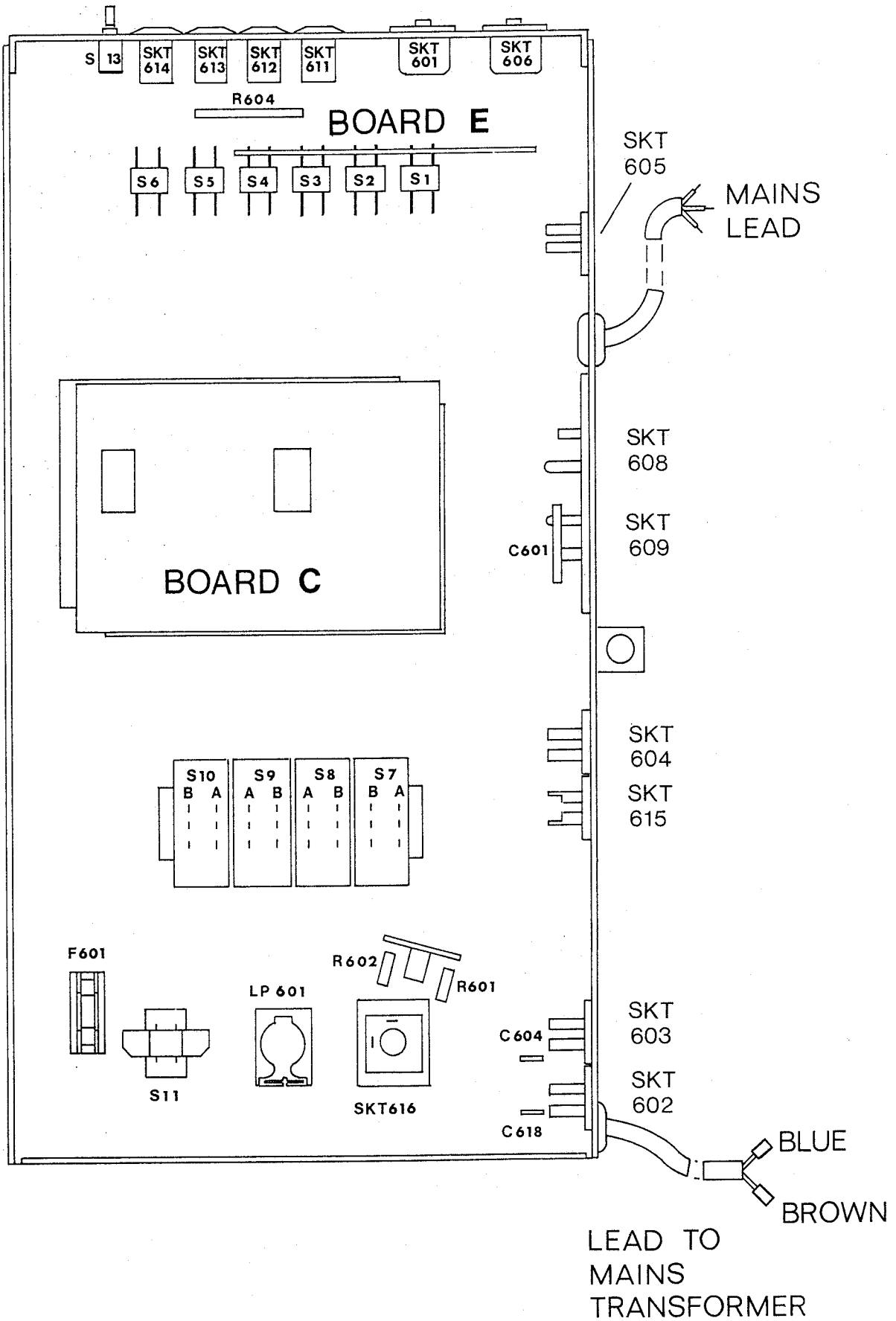
VHF aerial signals are fed directly to the RF amplifier built into the LP 1186 tuner module, which is a factory pre-aligned unit, providing RF amplification, local oscillator and mixer stages to generate a 10·7 MHz IF Frequency tuning is achieved by using vari-cap diodes controlled by a DC supply, regulated by TR 204, and this uses zener diodes of 12 and 16 volts rating. Double regulation is used to ensure absolute tuning stability in all conditions of use. Pre-set stations are selected by S14, which provides the required tuning voltage set up by R 605. IF signals from the tuner unit are fed into the LP 1185 IF amplifier and detector module, which provides three stages of band pass selection before the ratio detector re-constitutes the AF modulation contained in the FM signals.

MPX Decoder Section

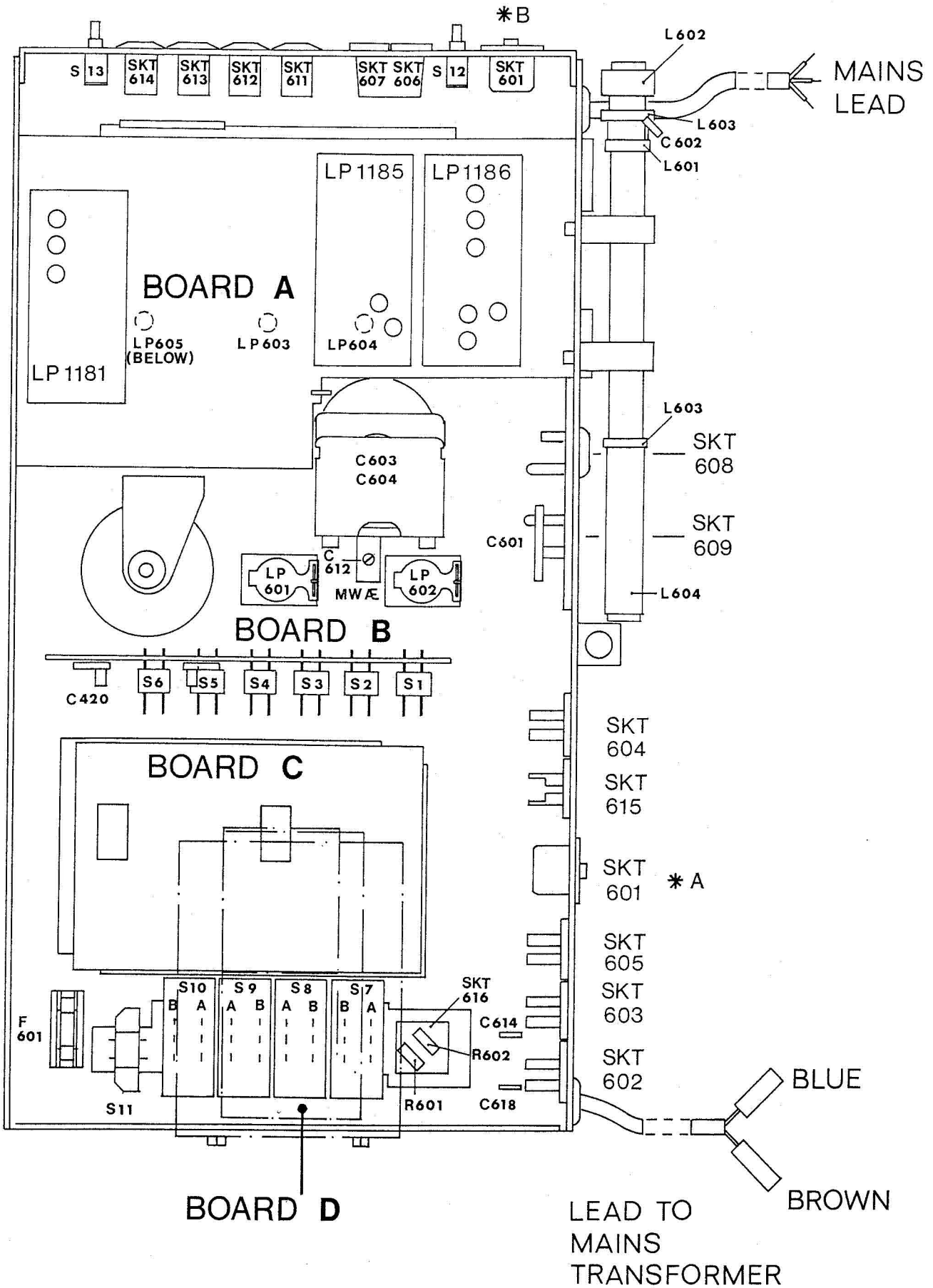
Stereo decoding is achieved with the use of an IC—(MC 1310P)—operating in a "Phase-Lock Loop". The only adjustment required for correct operation is to its local oscillator and a test-point is provided (412) so that accurate adjustments can be made. When the incoming signal is modulated with a 19kHz pilot tone carrier, the decoder automatically "locks on" to it and performs the necessary switching operations to re-establish the two stereo channels. As the left and right output signals have some of this switching signal present, it is necessary to filter this out to prevent heterodyne whistles when tape recording and unnecessary speaker currents; the filtering network is included in the BLR201–N module and consists of tuned circuits providing very sharp cut-off above 18kHz. When receiving a "mono" transmission the 19kHz tone is missing, therefore no switching is carried out by the decoder and both left and right hand channels are the same.

ENGINEER'S NOTES

UNDERSIDE VIEW
SA29 CHASSIS

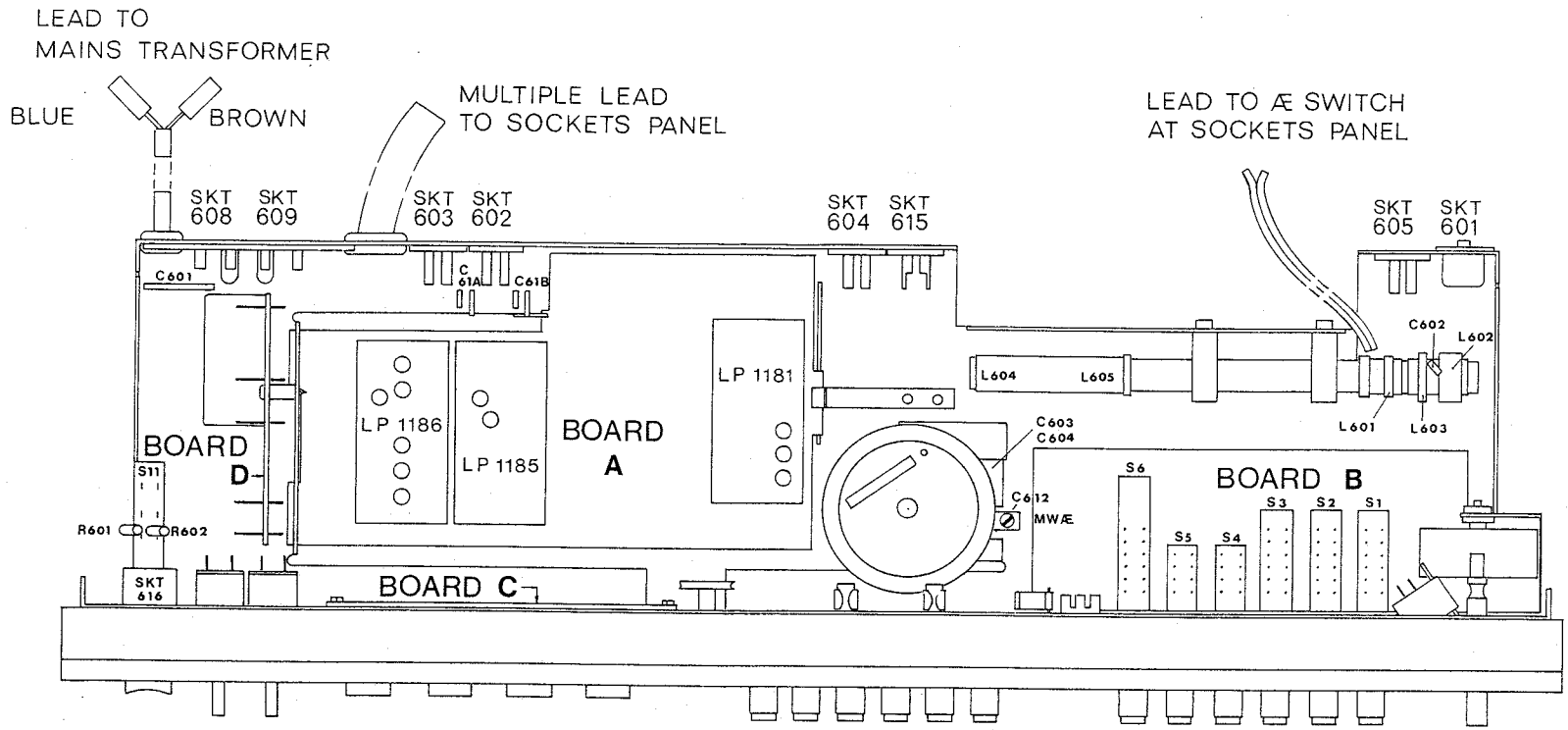


UNDERSIDE VIEW
SRX29 CHASSIS

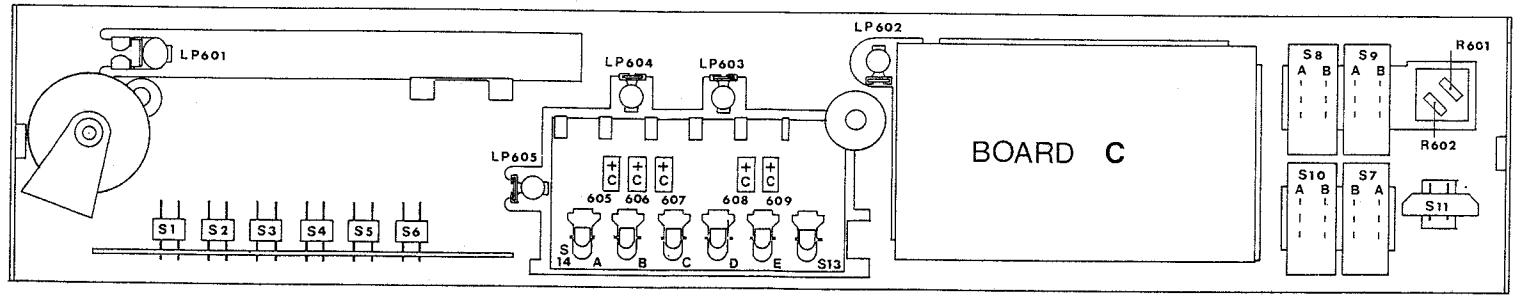


*A SOCKET 601 FITTED FOR USE WITH INTERNAL TAPE DECK.

*B SOCKET 601 FITTED FOR USE WITH EXTERNAL TAPE DECK.



TOP VIEW, SRX30 CHASSIS



FRONT PANEL, INSIDE VIEW, SRX30 CHASSIS

ENGINEER'S NOTES

ENGINEER'S NOTES

TAPE RECORDER SECTION, MODELS HFC 60, HFC 68 AND HFC 69 ONLY

CASSETTE TAPE UNIT MODEL N2505/51 WITH D.N.L. FITTED

AMPLIFIER CONTROLS

TO RECORD

From Radio. Select the appropriate button for the waveband required, i.e., LW, MW, SW or VHF, and then adjust the tuning to select the station required as for normal loudspeaker listening.

From a Gramophone Record. Select the "Gram" button and set the record player in operation.

From Microphone. Plug the Microphone into socket (1), Fig. 25, and then follow the appropriate instructions.

Note. The position of the volume and tone controls on the main amplifier front panel do not affect the recording level or tonal balance; should the operator wish to listen whilst recording, these controls should be adjusted to suit requirements.

NOT APPLICABLE TO MICROPHONE RECORDINGS.

If it is desired to record "silently" then the volume control should be set at minimum.

WHEN THE MICROPHONE IS USED THIS CONTROL MUST BE SET AT MINIMUM TO PREVENT FEEDBACK.

TO PLAY BACK

The "Tape" button should be selected and the volume and tone controls adjusted to suit personal requirements.

TAPE SOCKET

This socket at the rear of the chassis (Figs. 1, 2 and 3) can be used for:

a. Recording from radio or gram, if desired at the same time as recording on the internal recorder from the same source.

b. Re-recording from ext. tape recorder to int. tape recorder. Tape button 2 (Figs. 9, 10 and 11) to be depressed.

c. Playback int. tape recorder and re-record on ext. tape recorder. Tape button depressed.

Note. *b* and *c* can be monitored via headphone or loudspeakers.

TAPE UNIT OPERATING INSTRUCTIONS

THE CASSETTE RECORDER

. . . is a carefully designed piece of apparatus, which enables you both to record and play back either stereophonically or monophonically.

The combination of the Compact Cassette system and all-transistor circuit techniques enables the recorder to record or play back at any moment.

The lay-out of the controls ensures error-proof operation.

Recording

With a suitable microphone you can record conversations, singing, instrumental music or other sounds of interest.

Recordings can also be made from radio or record player.

(Note, however, that you should never record from a radio by holding a microphone in front of the radio loudspeaker.

Results so obtained are invariably inferior and disappointing.)

The recording of radio programmes and copying of gramophone records is permissible only so far as copyright or other rights of third parties are not thereby infringed.

Playback

The recordings made can be reproduced through the amplifier in the same manner as radio or records.

Compact Cassettes

You can make stereophonic or monophonic recordings over the full length of the recording tape in these cassettes in two directions, each recording being approximately half the width of the tape. When one half is full, you can turn over the cassette in order to use the other half. The cassette identifies the recordings on each side by appropriate markings.

Both ends of the tape are attached by a length of non-magnetic leader tape to the rotating hubs, threading of the tape therefore being unnecessary. This being so, the cassette is ready for immediate use. At any time, not only at the end of the tape, the cassette can be replaced by another or turned over in order to change from the one side to the other.

Compact Cassettes are available in four versions:

C-30: (Postal Pack) playing time 2×15 minutes;
C-60: playing time 2×30 minutes;
C-90: playing time 2×45 minutes;
C-120: playing time 2×60 minutes.

Note. On account of the non-magnetic leader tape, it is necessary when starting at the very beginning of a tape to allow the cassette to wind on for about seven seconds before starting to record.

Musicassettes

These are Compact Cassettes containing pre-recorded music. All types of music are available.

Musicassettes are safeguarded against accidental erasure of the tape and are usable on all Compact Cassette equipment.

STEREO

Listening to, say, an orchestra, your left ear hears the sound reaching it from the left a little earlier and louder than does your right ear. In the case of sound from the right, matters are reversed. Sound from directly in front of or behind you is heard simultaneously and equally loudly by both ears. Even with your eyes closed, therefore, you can "see" the orchestra; in other words you can determine the direction in which the various instruments lie.

In making a stereo recording of an orchestra playing, two microphones are employed, each receiving its own sound in the same way as your ears do. The sound is recorded on two separate "tracks", one track for the sound picked up by the left-hand microphone (left channel) and the other track for the sound picked up by the right-hand microphone (right channel). In reproducing the same recording stereophonically, the two tracks are played back through separate loudspeakers positioned some distance apart, the one speaker reproducing the left and the other the right channel. In this way the listener hears the orchestra as though it were playing in his actual presence.

With your new stereo recorder you yourself can make stereo recordings from radio broadcasts and gramophone records. All the stereo recordings you make can be reproduced stereophonically through the stereo amplifier.

It will be obvious, of course, that a true stereo recording cannot be made of, say, a non-stereo radio programme or gramophone record.

CONTROLS AND CONNECTION SOCKET

(See Fig. 25)

1. **Microphone socket.**
2. **Programme indicator with zero reset button**—for rapidly locating the positions of recordings on the tape.
3. **Cassette holder.**
4. **Cassette holder release knob**—pull this towards you to open the cassette holder (it will only operate if the start key 7 is not depressed).
5. **Record key**—press to record (together with key 7).
6. **Rewind key**—press to rewind at speed to the start of a recording or to the start of the tape (rewinding can be stopped with key 9).
7. **Start key**—press to start recording and playback.
8. **Wind key**—press to wind at speed to the start of a recording or to the end of the tape (winding can be stopped with key 9).
9. **Stop key**—press to stop recording, playback and fast winding or rewinding.
10. **Recording level indicator**—for checking the recording level.
11. **Pilot lamp**—will light up when the recorder is switched on.
12. **Mains switch**—press to switch the recorder on and off.
13. **Pause knob**—pull this towards you for brief interruptions of recording and playback without having to release the record key 5 and/or the start key 7. The pause knob cannot be operated during fast winding and rewinding.
14. **Recording level control**—for adjusting the recording level during recording.

Note. All keys except the stop key lock into position when pressed and are released by pressing the stop key 9. The pause knob 13 is released by pushing it back or by pressing the stop key.

SWITCHING ON AND OFF THE RECORDER

The mains on/off swtich No. 11 (Figs. 9, 10 or 11) must be "on" before the recorder will operate.

Switching on: Depress the on/off switch 12, the pilot lamp 11 will then light.

Switching off: Depress the on/off switch a second time. The pilot lamp will then be extinguished.

Note. Never switch off the recorder when the tape is in motion without first pressing the stop key 9 since such action may result in damage to the tape and the recorder itself.

INSERTING AND REMOVING THE CASSETTE

The cassette holder can be opened and closed only if the start key 7 is not depressed. To release the start key, if necessary, press the stop key 9.

Inserting

Pull knob (4) towards you. The cassette holder (3) will now spring up and open.

With the desired side of the cassette uppermost, and with the open part towards the control panel, push the cassette into the holder (Fig. 28).

Press the cassette holder down at the front until the holder locks in position.

Removing

Pull knob (4) towards you. The cassette holder (3) will now spring up and open; the cassette can now be removed.

PROGRAMME INDICATOR

Make it a habit to set the programme indicator (2) to "000", by pressing the zero reset button, immediately after inserting a cassette.

Note. The programme indicator does not directly indicate playing time of the cassette.

Remove the index label from the cassette box and write the reading of the indicator at which the recording commences together with the title of each recording on the inner side. Later you will be able to locate any of your programmes rapidly by fast winding or rewinding to the same reading.

Additional notes can be made on the back of the label and on the cassette itself. Fold the index label the other way round and return it to the box. Any notes you have made can then be seen through the lid (Fig. 27).

Notes:

1. If you have only used part of a cassette for recording, note the reading of the indicator at the end of the last recording before you remove the cassette. If this cassette is used again later on, the correct position to restart the recording can be located as follows:

   Press the rewind key (6) and completely rewind the tape.

   Press the zero reset button of the programme indicator.

   Press the wind key (8) and wind the tape at speed until you have almost reached the indicator reading previously noted and then press the stop key (9).

   Press the start key (7) and play back the cassette until the end of the last recording is reached and then stop the tape once more. You have now reached the blank portion of the tape and can continue recording.

2. The programme indicator can also serve in compiling an index for the contents of a Musicassette. To do this completely rewind the tape, press the zero reset button and note the reading of the indicator at the beginning of each item.

CONNECTIONS

Microphone

Insert the microphone plug into socket (1) (Fig. 25).

RECORDING

(stereo and mono)

Introduction

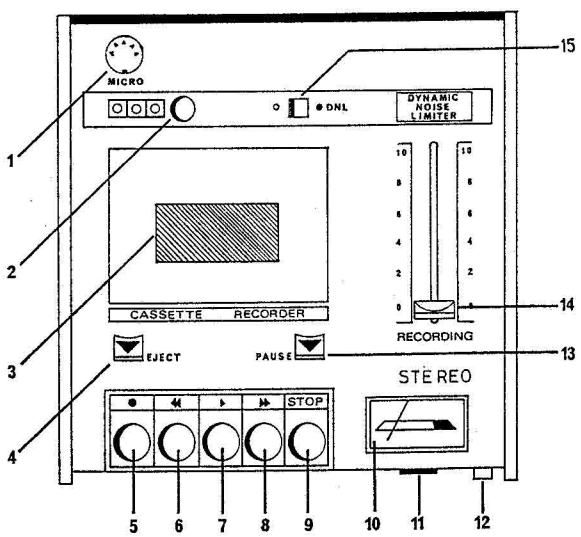
During recording, a previous recording on the same section of tape is automatically erased.

The strength at which the sound is recorded on the tape determines the quality of the sound obtainable on playback. If the "recording level", as this is called, is too low, too much noise (hiss) will be heard on playback. If the recording level is too high, distortion will be heard on playback. The recording level is adjusted with the recording level control (14) and can be checked by reference to the recording level indicator (10). The recording level can be set prior to commencement of recording, but, should circumstances rule this out, the level may also be adjusted during recording.

The recording is not affected by the position of the volume and tone controls on the front control panel.

Stereo microphone recordings can be made only if a **stereo microphone** is used.

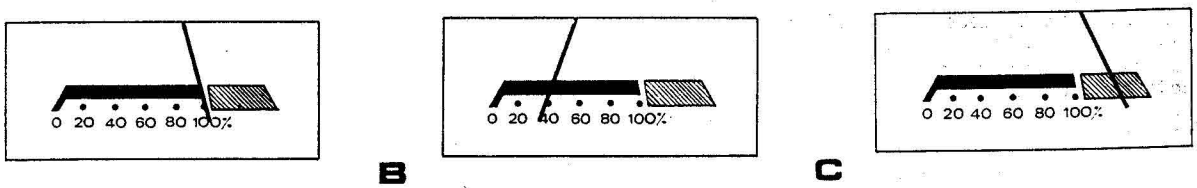
TOP VIEW OF CASSETTE TAPE UNIT



1. Microphone socket
2. Counter with zero reset
3. Cassette lid with window
4. Cassette ejecting knob
5. Record stand-by key
6. Fast rewind key
7. Start key
8. Fast forward key
9. Stop key
10. Illuminated meter
11. Red on/off indication lamp
12. On/off switch
13. Pause knob
14. Recording control
15. On/off switch for D.N.L.

Fig. 25

RECORDING LEVEL METER ILLUSTRATIONS



A B C

Fig. 26

CASSETTE ILLUSTRATIONS

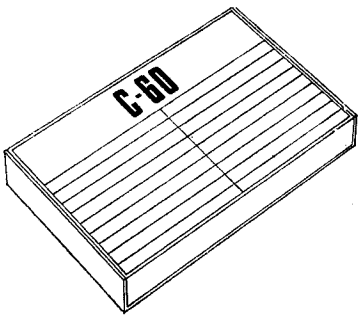


Fig. 27

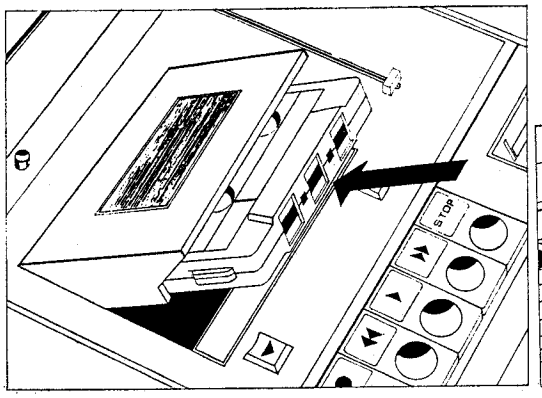


Fig. 28

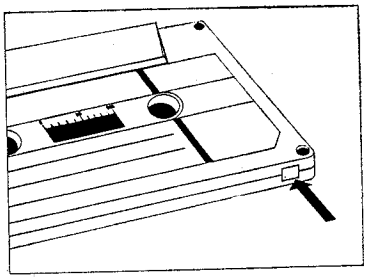


Fig. 29

STEREO MICROPHONE ILLUSTRATIONS

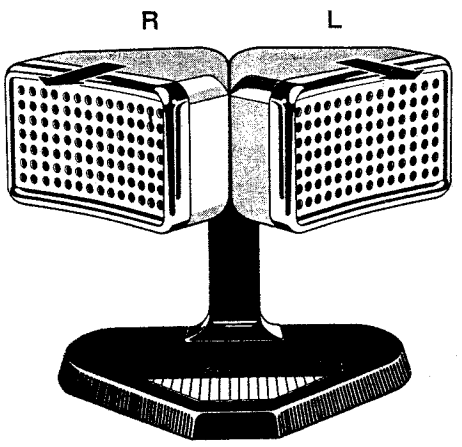


Fig. 30

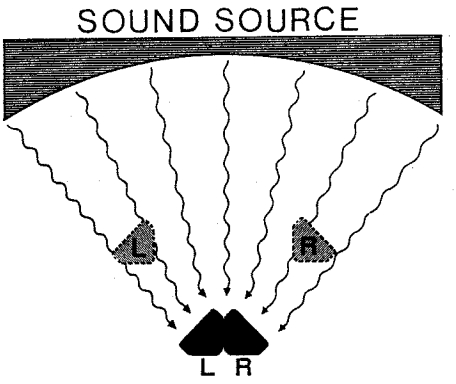


Fig. 31

See Page 36 for instructions for using the Stereo Microphone.

Operating Instructions—continued

Recording

Insert a cassette in the cassette holder (3). Pull the pause knob (13) towards you. Press the record key (5) and the start key (7) at the same time.

Speak or sing into the microphone or let the other equipment operate, sliding the recording level control (14) upwards to the point where, during the loudest passages, the pointer of the recording level indicator (10) just reaches 100% (Fig. 26A). The recording level is then correctly adjusted. Should the pointer fail to reach 100% (Fig. 26B) the recording level is too low, whilst if the pointer moves continuously past 100% (Fig. 26C) the level is too high.

Now start the recording by pushing the pause knob (13) back. Check the recording level from time to time and readjust it (gradually) as necessary.

For brief interruptions pull the pause knob (13) towards you. To stop, press the the stop key (9).

Note. At the end of the cassette the tape stops automatically and the motor of the recorder is switched off. Depressed keys, however, will remain in position; therefore, in this case, too, **press the stop key in order to prevent the pressure roller in the driving mechanism from being distorted.**

PLAYBACK

Insert a recorded cassette in the cassette holder (3). Depress the "Tape" button on the front panel. Press the start key (7). Adjust the volume and tone controls to suit personal requirements.

For brief interruptions pull the pause knob (13) towards you. To stop, press the stop key (9).

ERASING WITHOUT RECORDING

A recording can be erased from the tape without a new recording being added. To do this:

Slide the recording level control (14) to "0". Press the record key (15) and start key (7) at the same time.

To stop, press the stop key (9).

SAFEGUARD AGAINST ACCIDENTAL ERASURE

You can prevent the accidental erasure of your recordings, some of which will hold great value for you, in the following way. With a screwdriver or other suitable object, break out the flap on the back of the cassette opposite the 2 (Fig. 29) (for a recording on side 1) or that opposite the 1 (for a recording on side 2).

Thereafter, with the cassette in the recorder the record key (5) cannot be depressed in consequence of which the cassette can only be played back.

MAINTENANCE

In normal circumstances the recorder will require no special attention in the way of maintenance. It is recommended, however, to remove from time to time the oxide dust which has collected on and around the magnetic heads. For this purpose a cleaning tape should be used. Furthermore, it is a good plan to examine the recorder perhaps once a year or after every 500 hours of operation. Then, the equipment can be cleaned, checked and adjusted where necessary, and parts subject to wear can be replaced in good time.

Note: The driving mechanism must not be lubricated!

ACCESSORIES

Compact Cassettes C-60, C-90 and C-120.
Cleaning tape, 811/CCT.
C-30 (postal pack).

STORAGE OF CASSETTES

Protect cassettes against dust, etc., by returning each cassette to its box immediately after use.

Store the cassettes at room temperature, not very close to loudspeakers or transformers (as damage may be caused to the recording by the magnetic field from these items) and away from sunshine.

DYNAMIC NOISE LIMITER

The Dynamic Noise Limiter (D.N.L.) built into the Cassette unit is an active device with dynamic characteristics to improve the subjective signal/noise ratio of existing tape recordings, and operates during playback only.

It reduces amplifier noise and tape hiss to a significant degree without affecting the natural brilliance of music and without unwanted side-effects, it is selected by Switch 15 Fig. 25.

The D.N.L. is active only during silent intervals and soft passages in the recorded material, when background noise is most objectionable; during loud passages the filter action is automatically by-passed.

The D.N.L. is fully compatible and all pre-recorded material, old and new, will benefit from its action.

THE RECORDING CHARACTERISTICS REMAIN UNAFFECTED.

Note: In some instances defects in the recorded material are masked by the background noise, when the background noise is removed by D.N.L. action these defects can become apparent.

STEREO MICROPHONE

The stereo microphone N8402/03 consists of a table stand with two detachable mono microphones (microphone units), one for the left-hand channel and one for the right-hand channel. The microphone units are marked "**L**" (left-hand channel) and "**R**" (right-hand channel) at the rear. The microphone units can be removed from the table stand by sliding them towards the front (Fig. 30).

A two-core cable is fitted, each core being connected to one microphone unit. In order that the two microphone units can be separated the cable has been split for about 1 yard (1m) from the microphone. If greater separation is required the cable can be split further after removal of the metal securing ring (this ring should be refitted to prevent accidental splitting of the cable).

Whether the units are fitted to the table stand or separated, unit **L** should be at your left-hand side and unit **R** at your right-hand side as you face the sound source (Fig. 31).

When the microphone units are fitted on the table stand, the word "STEREO" must be pointed towards the centre of the sound source(s). When used separately, the silver coloured grille of each unit should face the relevant sound source.

Position the microphone not too close to the recorder and, if possible, on a different table so as to prevent the microphone from picking up unwanted noise from the recorder.

It is also important to ensure that the general background noise level is as low as possible, by closing windows to avoid traffic noise, etc.

Using the microphone, you can record, stereophonically speech, vocal and instrumental music (solo or group).

In recording speech, best results are obtained if the distance between mouth and microphone is about 12" (30 cm).

When recording a group, either vocal or instrumental, the most suitable distance between the microphone units and sound source(s) must be found by making trial recordings.

The stereo effect is greater the farther apart are the left and right sections of the sound source(s) or the nearer the microphone units are to the corresponding section of the sound source(s).

The quality of sound is also affected by the acoustics of the room in which the recording is made. Speech recorded in a room containing large sound reflecting surfaces such as windows or bare walls will be accompanied by disturbing echoes when reproduced. This can be prevented either by reducing the distance between mouth and microphone or by drawing the curtains and, if possible, covering the walls with cloth or other suitable material. When recording instrumental or vocal music, however, some echo is necessary for best results, so there is no need to draw the curtains. For **mono** recording, only the **left-hand** microphone unit (L) is used. Its silver-coloured grill must then be directed towards the sound source.

NOTE. Unless it is impossible to arrange a direct connection between the amplifier and the tape recorder, the microphone should never be used to record the sounds from a loudspeaker as the quality will suffer, when compared with a direct recording.

ENGINEER'S NOTES

TECHNICAL DATA

Suitable for both stereo and mono recording and playback.
Fully transistorised.
Compact Cassette system.
Tape speed: 1⅞"/sec. (4·75 cm/sec.).
Frequency range: 60–10,000Hz (DIN and within 6dB).
Signal/noise ratio: better than 45dB (DIN).
Wow and flutter: ≦0·3% (measured with EMT 420).

Mains voltage: 110–127–220–240V.
Mains frequency: 50–60Hz.
Power consumption: 5W.
Number of tracks: 2×2 (stereo).
Track width: 2×0·6mm.
Tape width: 3·81mm (in compact cassette).

Diode-output voltage: ≥0·5V (20kΩ).
Input sensitivities (at 100% modulation):
phono: ≤100mV (1MΩ).
microphone: ≤0·2mV (2kΩ).

Maximum playing time: 2×60 minutes with the C-120 Compact Cassette.
Fast wind time per side:
80 sec for a C-60 Compact Cassette;
120 sec for a C-90 Compact Cassette;
160 sec for a C-120 Compact Cassette.
Permissible ambient temperature: 5–45°C (41–113°F).

CHASSIS PARTS

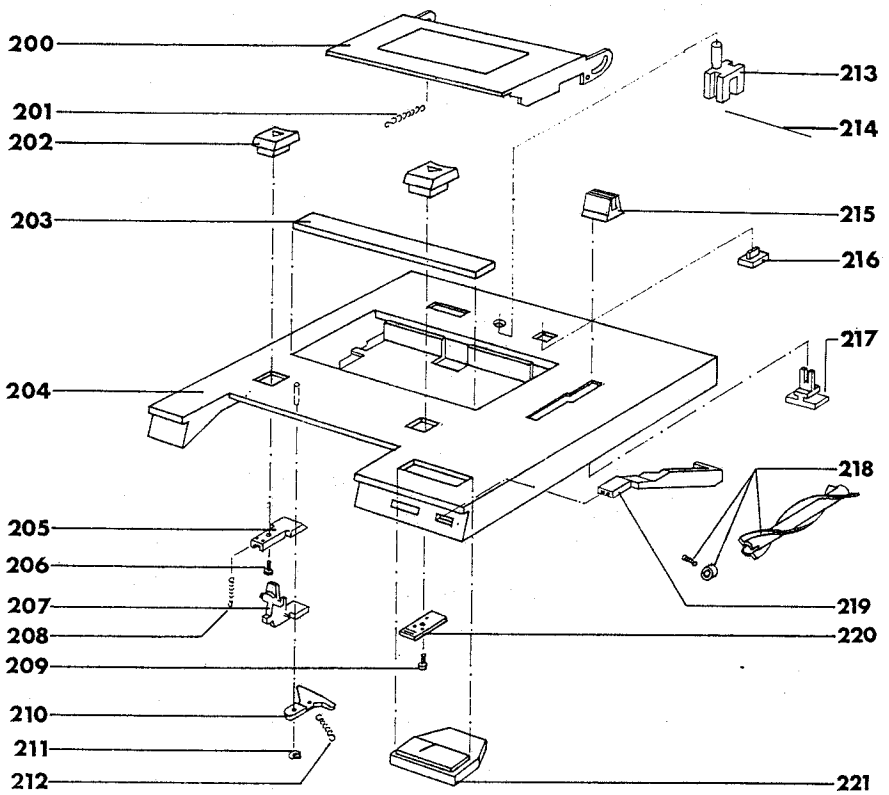


Fig. 32

Pos.	Code number	Description
200	4822 443 60339	Cassette cover
201	4822 492 30652	Spring of cassette cover
202	4822 410 20983	Knob (pause/cassette cover)
203	4822 460 20097	Covering plate
204	4822 443 30235	Upper cabinet section
205	4822 403 50609	Slide
206	4822 502 30079	Self-tapping screw
207	4822 403 50494	Lever
208	4822 492 30651	Spring
209	4822 502 30011	Screw
210	4822 403 50578	Locking bracket

Pos.	Code number	Description
211	4822 530 70116	Retaining ring dia. 4
212	4822 492 30651	Spring
213	4822 410 21299	Counter knob
214	4822 492 61856	Spring
215	4822 413 40598	Knob (volume control)
216	4822 413 70081	Knob (DNL)
217	4822 403 50592	Slide for wormwheel
218	4822 535 90784	Wormwheel assy.
219	4822 410 21066	Knob (mains switch)
220	4822 466 90676	Slide
221	4822 347 10051	Recording level indicator

REPAIR INSTRUCTIONS

Removal of Cassette Deck from cabinet

See Notes on Page 17 (HFC 60).

Replacing the worm-shaft of the recording control

- To gain better access to the worm-shaft, it is recommended to remove the power unit (see above).
- After removal of screws K and K' the bracket on which the potentiometer is mounted can be slid back and lifted out.
- During refitting, set the slide knob to position "0" and turn the potentiometer with worm-shaft fully clockwise.
- check that the slide control fits underneath the rib of the worm-shaft.

Replacing the drive belt 92

- Remove the bottom of the set.
- Remove the bracket of flywheel bearing 123.
- Replace belt 92.
- After replacement, readjust the bracket of the flywheel bearing. See "Mechanical adjustments and tests".

Replacing the push-buttons

- Uncase the recorder.
- Remove spring 63.

Note: When replacing the playback push-button, also remove the record and the rewind push-buttons. Straighten the bent part of bracket 77 (under the push-button).

- Remove the push-botton with a tilting movement.

Replacing right-hand reel disc 98

- Uncase the recorder.
- Remove cap 97.
- Remove the reel disc from the reel-disc spindle.

Replacing the left-hand reel disc 83

- Uncase the recorder and remove the p.c. board (screws E, E' and F).
- Remove clamping ring 11, counter belt 125, counter belt pulley 106 and clamping ring 104.
- Remove the reel disc together with its spindle from the bearing.

Replacing flywheel 121 and winding friction clutch 133

- Remove the bottom of the set.
- Remove the bracket of flywheel bearing 123.
- Remove nylon clamping ring 90.
- Remove drive belt 92.
- Remove the flywheel and the winding friction clutch at the same time.

Notes:

1. When assembling, be sure that the cam on friction bracket 133 engages the hook of spring 105.
2. Readjust the bracket of the flywheel bearing after assembly. See "Mechanical adjustments and tests".

Replacing collector 102

In the factory collector 102 is riveted onto the mounting-plate; the two rivet bushes also serve as terminals of the supply wires.

This method is less suitable for servicing. Therefore, Dynatron Service Department supplies a special collector to which already two bushes with an insulating ring have been riveted (code number 4822 310 20218). This collector should now be glued to the mounting-plate with e.g. a two component adhesive 4822 390 30014.

The supply wires can then be soldered to the 2 rivet bushes in the normal manner.

LIST OF MECHANICAL PARTS

Pos.	Code number	Description
1	4822 502 10745	Screw M2×5
2	4822 532 10331	Ring dia 2·2
3	4822 530 70043	Clamping ring dia 2·3
4	4822 532 10332	Ring dia 3·2
5	4822 502 10951	Screw M2·5×5
7	4822 530 70121	Clamping ring dia 1·5
8	4822 502 11053	Screw M3×8
9	4822 530 70124	Clamping ring dia 4
10	4822 530 70115	Clamping ring dia 3
11	4822 530 70174	Clamping ring dia 1·5
12	4822 530 80081	Ring dia 2·8
14	4822 502 11249	Screw M2×10
15	4822 502 10909	Screw M2·5×8
16	4822 532 10215	Ring 2·8×7×0·5
17	4822 530 70122	Clamping ring dia 1·9
21	4822 502 10813	Screw M2·5×6
22	4822 530 70114	Clamping ring dia 2
51	5822 249 40046	Erase head K2
52	4822 492 30655	Tension spring
53	4822 403 50584	Slide
54	4822 492 30654	Tension spring
55	4822 492 30836	Spring
56	4822 403 10115	Bracket assy.
58	4822 410 20988	Push-button (recording)
59	4822 410 20985	Push-button (rewind)
60	4822 410 20986	Push-button (play)
61	4822 410 20987	Push-button (wind)
62	4822 410 21059	Push-button (stop)
63	4822 492 50676	Tension spring
64	4822 492 61314	Leaf spring
65	4822 520 40005	Ball bearing
65a	4822 402 60321	Bracket
66	4822 520 30226	Bushing
67	4822 532 50268	Plastic retaining ring
68	4822 403 40039	Pressure roller
69	4822 249 10059	Rec./PB head K1/K101
70	4822 532 50043	Plastic ring
71	4822 532 10544	Bushing
72	4822 492 50966	Tension spring
73	4822 492 50808	Tension spring
74	4822 492 30653	Spring
75	4822 403 50723	Lever
76	4822 403 50431	Bracket
77	4822 403 50587	Bracket (assy)
78	4822 402 60322	Bracket
79	4822 492 40416	Spring
80	4822 492 40117	Torsion spring
82	4822 528 80409	Roller
83	4822 528 10227	Left-hand turntable
84	4822 492 30655	Tension spring
85	4822 500 10137	Screw
86	4822 492 30777	Tension spring
88	4822 492 40374	Spring
89	4822 492 60344	Spring
90	4822 532 50265	Ring
91	4822 528 90081	Roller
91a	4822 278 90008	Switch SK6
92	4822 358 30152	Belt
93	4822 492 30778	Spring
93a	4822 403 50591	Bracket
94	4822 492 40438	Spring
96	4822 403 10118	Brake bracket
97	4822 462 70107	Cap of turntable
98	4822 528 10225	Right-hand turntable
99	4822 492 61534	Pressure spring
100	4822 532 50648	Ring
101	4822 535 90062	Turntable spindle
102	4822 310 20218	Collector SK3
103	4822 520 30225	Bearing bush of capstan
104	4822 530 70119	Ring
105	4822 492 60345	Spring
106	4822 528 90173	Pulley
107	4822 403 50576	Bracket
109	4822 492 60912	Spring
111	4822 403 20083	Bracket with idler wheel
112	4822 403 50703	Switch bracket
115	4822 532 50262	Ring
116	4822 278 90223	Switch SK4
117	4822 528 80147	Pulley
120	4822 358 30077	Belt
121	4822 528 10228	Flywheel
122	4822 520 10219	Bearing plate
123	4822 520 10292	Bearing bracket
124	4822 349 50067	Counter
125	4822 358 30148	Counter belt
126	4822 532 70078	Rubber strip around motor
127	4822 361 20063	Motor
128	4822 532 50855	Felt ring
129	4822 528 70123	Pulley
132	4822 530 70119	Retaining ring
133	4822 528 20162	Complete winding friction

EXPLODED VIEW—COMPLETE DECK

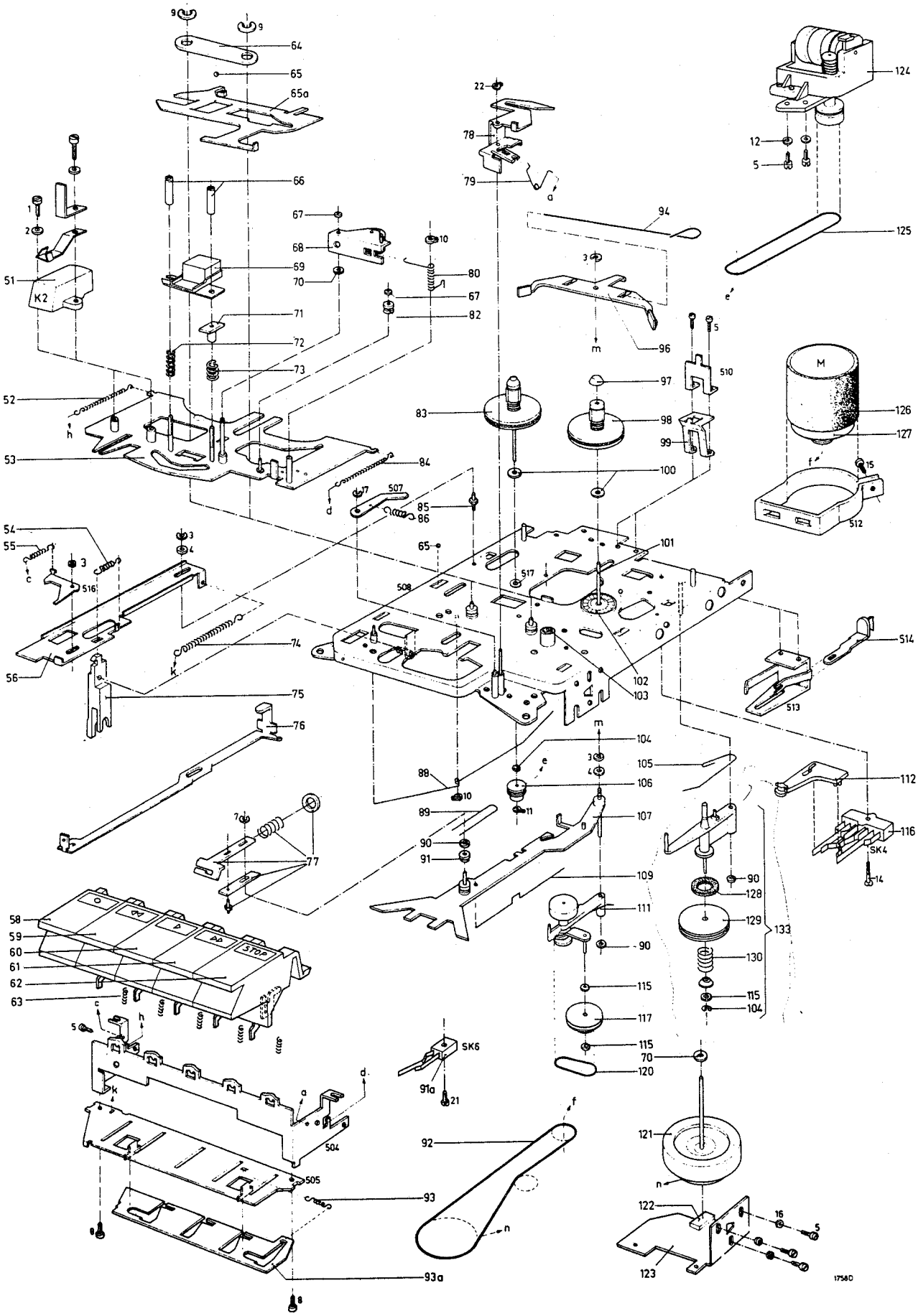


Fig. 33

MAINTENANCE

After 500 working hours, clean the recorder and lubricate the most important lubrication points.

Clean with alcohol or methylated spirit*

- Erase head
- Record/playback head
- Cords
- Reel discs
- Idler wheels
- Capstan
- Pressure roller

***NOTE:** ALCOHOL AND METHYLATED SPIRIT ARE BOTH HIGHLY INFLAMMABLE AND POISONOUS AND SHOULD BE HANDLED WITH GREAT CARE.

Lubricating instruction

- Shell Alvania 2 (4822 389 10001)
  Is used for lubricating the ball bearings: for example, the ball bearings between the mounting plate and slide 53.
- Lubricant 10 (4822 390 10003)
  Is used for lubricating the contact surfaces; for example, brackets 505, 107, 56.
- All purpose oil (4822 390 10048)
  Is used for lubricating spindles and bearings; for example, spindles of reel discs, bearings of idler wheels, the capstan bearing.
- Silicone grease (4822 390 20023)
  Is used for greasing plastic components.

Required service tools

- Jig (4822 402 60245) for adjustment of the height of the record/playback head.
- Test cassette (8945 600 13501) for azimuth alignment of the record/playback head and checking the tape speed.

MECHANICAL ADJUSTMENTS AND TESTS—TAPE ADJUSTMENTS

Adjustment of record/playback head 69 (see Fig. 33)

a. Height adjustment of right-hand side

For this adjustment, a special jig is used (see A in Fig. 35).

- Uncase the recorder.
- It is assumed that the capstan is in a perpendicular position.
- Set the recorder to position "Playback".
- Slide jig A over the capstan while pressure roller 68 is pulled back. The jig must be slid over the capstan so far that the capstan is precisely in line with the tape guides of the erase head and the record/playback head.
- If the record/playback head has been adjusted to the correct height, the jig will be slid exactly between the tape guides of the above-mentioned heads. If this is not the case (the record/playback head is too high or too low) the head may be adjusted with nut 66B. (After that, lockpaint nut 66B).

b. Azimuth alignment (left-hand side)

- Insert a test cassette (6300 Hz); code number 8945 600 13501.
- Connect a valve voltmeter to diode output BU1 between points 3 and 2.
- Set the recorder to position "Playback".
- Adjust the record/playback head with nut 66A so that a maximum output voltage is measured. (Make a note of this value).
- Connect the valve voltmeter to points 5 and 2 of BU1.
- Measure the output voltage and adjust for maximum value with nut 66A. (Make a note of this value, too).
- Adjust the record/playback head to the average of the two values referred to above so that the output voltages of the two channels are equally high. After that, lockpaint nut 66A.

Note: For the azimuth alignment the tape deck need not be removed. Nut 66A is accessible after dust cover 203 has been removed.

Checking the pressure force of pressure roller 108 (see Fig. 36)

In position "Playback", the force required to lift the pressure roller just off the capstan is between 150 and 190 g. This force is adjusted when the torsion spring is hooked in another mounting hole.

In position "Playback", the clearance between the pressure roller lever and cam A must be at least 0·5 mm. This clearance is adjusted when cam A is bent.

Checking the winding friction 133 (Fig. 36)

It may occur that the tape in the cassette is irregularly or not wound onto the right-hand turntable, causing the tape to be damaged.

This fault may be caused by:

a. *Height adjustment of right-hand side*

b. *Azimuth alignment (left-hand side)*

c. *Incorrect pressure of the pulley of idler bracket* 133 *on to right-hand turntable*

This force must be between 70 and 100 grammes depending on the winding friction.
This is measured as follows:

- Make the auto-stop circuit inoperative by short-circuiting the collector and emitter of TS472.
- Connect an mA-meter between point 8 of SK4 and the motor control board (C42 in wiring diagram).
- Set the recorder without cassette to position "play" and read the current consumption.
- Block the right-hand turntable and read the current consumption. This must increase by 8–16 mA.
- If the current increase is less than 8 mA, the pressure of the pulley of idler bracket 133 onto the right-hand turntable must be reduced to min. 70 grammes (see Fig. 36).
- If the current increase is more than 16 mA, the pressure must be increased to max. 100 grammes.

The pressure can be adjusted by slightly bending wire spring 105. If no current increase of 8–16 mA can be obtained in this way, the probable cause of the fault is:

d. *Winding friction too low*

It is recommended to replace the friction felt or, if necessary, also the spring and the friction wheel (see Fig. 36, pos. 133).
If the friction unit cannot be disassembled, replace the complete winding friction (see Repair Instructions).

e. *Too much friction in the cassette*

When the current increase stated under para. a is between 8 and 16 mA, the fault is caused by too high a friction of the tape in the cassette.

Checking hold-down spring 99 (see Fig. 37)

The force with which the cassette is held down, should be between 200 and 300 g. This is measured with a spring pressure gauge.

UNDERSIDE OF TAPE DECK

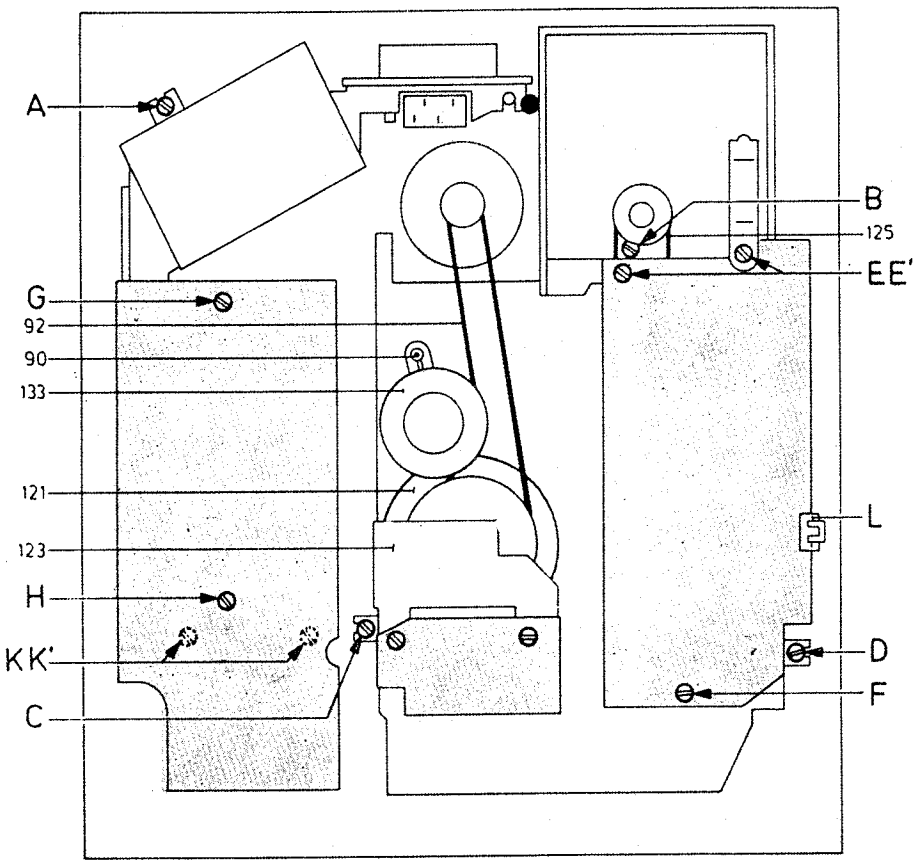


Fig. 34

ENGINEER'S NOTES

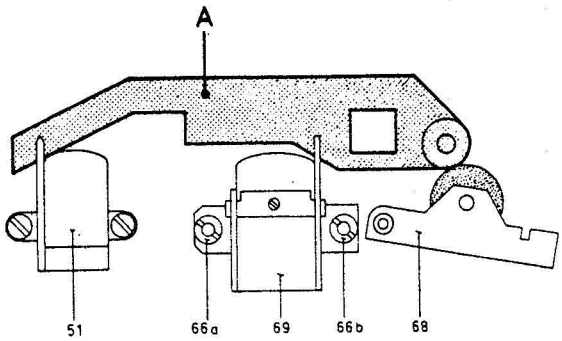


Fig. 35

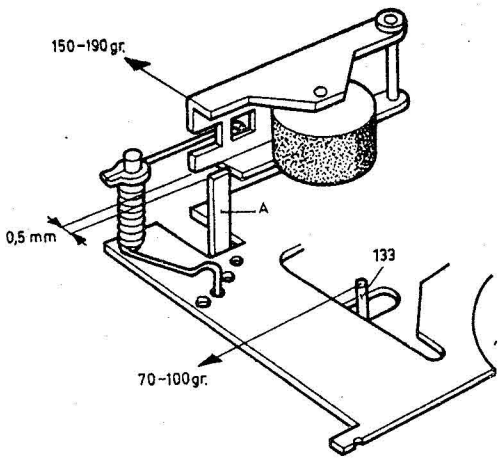


Fig. 36

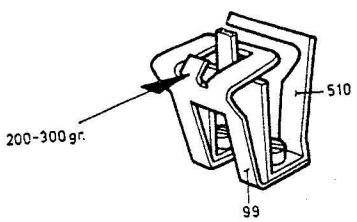


Fig. 37

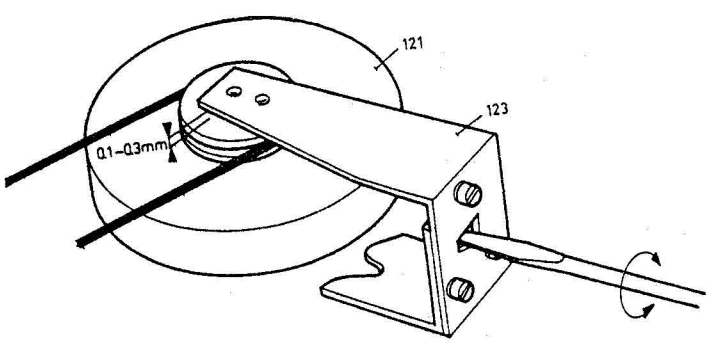


Fig. 38

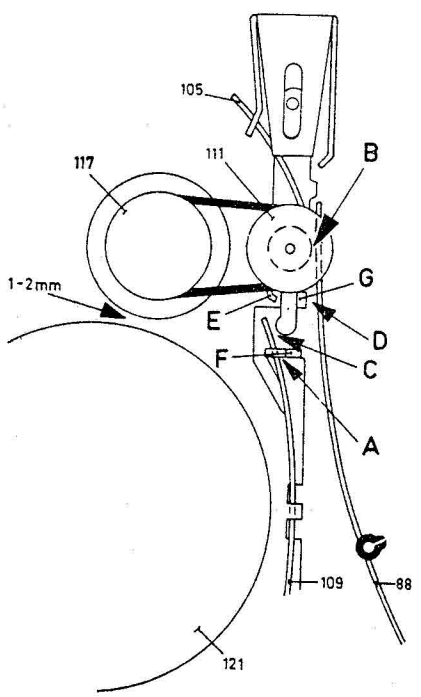


Fig. 39

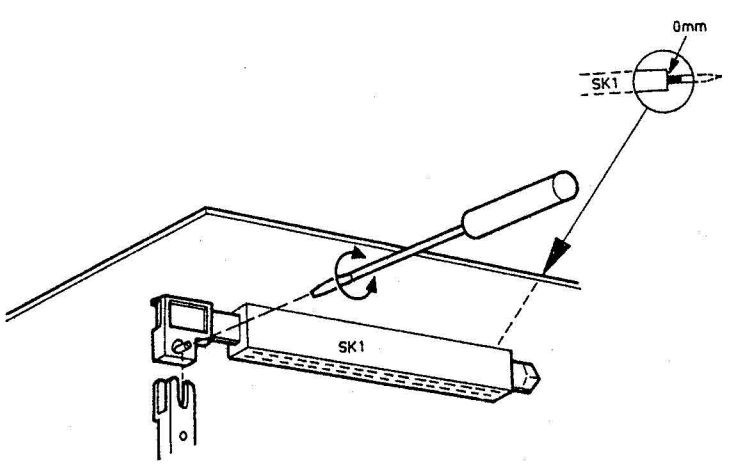


Fig. 40

CHECKING AND ADJUSTING THE DRIVE MECHANISM

Checking the rewind mechanism (see Fig. 39)

a. In position "Playback" the clearance between the flywheel and idler wheel 117 should be 1–2 mm. Adjust this clearance by bending tag E.
b. In position "Rewind" the clearances A and B should be at least 0·2 mm. Adjust these clearances by bendlng tags F and G.
c. In position "Wind" the clearances C and D should be at least 0·2 mm. Adjust these clearances by bending tags F and G.
d. In the positions "Playback", "Wind" and "Rewind" the brake bracket must abut on the two stop tags on the mounting plate. The clearance between the reel discs and the brake bracket should then be at least 0·3 mm.

Adjusting the flywheel (see Fig. 38)

- Place the recorder upside down.
- In this position the clearance between the underside of the capstan and the bearing plate should be 0·1–0·3 mm.
- Adjust this clearance by displacing bracket 123 with a screwdriver.

Adjusting the motor

The height of the motor must be so adjusted that the motor pulley, the belt grooves of the flywheel and the friction clutch are flush.

ADJUSTMENT OF THE SWITCHES

Switch SK1 (see Fig. 40)

- Remove the bottom.
- Depress the push-button "Record".
- Adjust the slide of switch SK1 so that the clearance between the first marking spot on the slide and the casing of the switch is zero (0 mm).

(The marking spot is visible through a hole in the p.c. board.) Adjust this clearance by turning the spindle of the slide switch with the aid of a screwdriver.

ELECTRICAL CHECKS AND ADJUSTMENTS

Adjusting the recording level indicator

- Set the recorder to position "recording".
- Disable the oscillator by short-circuiting points B–E of TS434.
- Interconnect the Phono inputs 3BU2 and 5ST1.
- Connect a signal generator (frequency 1 kHz) to the interconnected Phono inputs.
- Adjust the output voltage of the signal generator so that the voltage on test point 6BU1 averages 3·3 mV.
- Adjust R442 so that the pointer of ME403 is at the separation of red and white.

Checking the erase oscillator voltage

- Set the recorder to position "recording".
  The voltage across the erase head should be at least 15 V at a frequency of 50 to 70 kHz.

Adjusting the bias current

When adjusting the bias, one should find a compromise between frequency range and distortion. When the bias current is too small, distortion will arise. At too high a bias current the high frequencies are excessively attenuated.

- Set the recorder to position "recording".
- The voltage on test point 6BU1 should be between 9·5 and 25 mV. The value can be adjusted with preset potentiometers R439 (R440).
  In most units the bias current is correct when the voltage on the test points is approx. 17 mV.

Checking the tape speed

The tape speed can be checked:
With a test cassette on which an 800 Hz signal has been modulated every 4·76 m (code number 8945 600 13501).

- Insert the test cassette.
- Set the recorder to position "playback".
- The time between 2 subsequent signals should be 98 to 102 secs.

When the tape speed is too low, first check that the pressure roller, winding friction, flywheel, etc. do not run heavily. After this, the speed can be adjusted with R481 on the motor control board.

Checking the automatic stop

If the automatic stop does not function properly, first check whether the defect is located in the electronic section or in the rotary switch. This can be verified by measuring the voltage on junction C826, R667. The voltage on this point should be 3 to 4 V. If this value is measured, the collector and the rotary switch are in order, and the fault is located in the electronic section. If the value is not correct, the collector and the rotary switch must be checked and, if necessary replaced.

Checking the Dynamic Noise Limiter

- Unsolder the wire to point 19 of on the DNL-p.c. boards. (point 17 for the right-hand channel).
- Solder between points 18 and 19 a 100-Ω-resistor.
- Connect a tone generator via a 10-k Ω-resistor to point 19.
- Adjust the voltage of the tone generator so that a voltage of 2·5 mV 2 kHz available between points 18 and 19.
- Increase the frequency from 2 kHz to 8 kHz.
- At output 3BU1 (5BU1 for the right-hand channel) one should see a decrease in voltage of 1·5–2 mV.
- If the DNL filter has been switched off, one should not see a decrease in voltage of any importance if one increases the frequency.
  Stage sensitivities of the DNL filter at an input level of 5 mV 10 kHz.

Transistor left-channel	TS446	TS448	TS450	TS452
C	—	—	130 mV	0,75 V
B	5 mV	3,6 mV	5,1 mV	130 mV
E	5 mV	5 mV	4,8 mV	120 mV
Transistor right-channel	TS447	TS449	TS451	TS453

DYNAMIC NOISE LIMITER

Purpose

To suppress noise without a noticeable deterioration of the reproduction quality.

During soft passages, noise suppression is most essential because it is then more conspicuous. During loud passages, however, suppression is not necessary, as the signal-noise ratio is then high.

Working

The working of the DNL system is explained by means of the block diagram (Fig. 41).

Vin is split up at the input into V1 and V2. V1 is fed to the output via a phase inverter (above 10 kHz 180°) and a fixed attenuator.

V2 is passed through a high pass filter with a cross-over frequency of 5·5 kHz and is subsequently amplified.

At an input voltage Vin of 7·5 mV to 780 mV, V2 is reduced to 0V by the variable attenuator. As a result, only V1 is present at the output, which contains the entire frequency spectrum. At an input voltage of Vin 0V to 7·8 mV, the attenuation of V2 the variable attenuator is less.

At the output both V1 and V2 are present. V2 contains all

frequencies of 5·5 kHz and higher and these are in phase opposition to those of V1. As a result, the high frequencies will be attenuated when they appear at the output.

Circuit description

TS446 with R608 and C774 form an all-pass filter. It causes the phase of V1 to lag Vin increasingly until at 10 kHz a phase shift of 180° relative to Vin is attained.

The high pass filter consists of 3 RC networks, viz. C776 with R612, C778 with R616, R618 and the input resistance of TS448. The gain of TS448 is slightly higher than unity and is governed by the ratio of R620/R614.

The third RC network is formed by C780 and the Ri of TS452.

The overall attenuation of these filters is 18 dB/octave at a cross-over frequency of 5·5 kHz.

The ratio R624/R626 determines the gain of TS450. R622 and R626 ensure that the RC network with C780 has the correct and stable input resistance.

TS450 and TS452 can be overdriven by an excessive drive signal. In order to prevent this, a balanced limiter circuit has been included consisting of D454 and D456. When the emitter signal of TS452 is too high, the diodes become conductive thus limiting the signal on the base of TS450. C782 only serves for blocking the d.c. component. R636 and R638 form the fixed attenuator.

V1 is attenuated by R632 and is then fed to the output. To prevent the Dynamic attenuator responding to the lower frequencies of V1, C792 has been included.

The amplified signal from TS452 controls the dynamic attenuator. To prevent this attenuator from becoming operative at very high frequencies (above 10 kHz), this control signal is attenuated by means of C786.

The control signal is full-wave rectified by D458 and D462, thus charging C788 positively and C790 negatively.

When there is a signal V2 which exceeds the switching level (Viz ≤ 38 dB below zero level), the direct voltage across C788 and C790 becomes so high that the two diodes, D460 and D464, become conductive (see fig. 42). As a result, V2 will be attenuated to an extent which depends on the degree of conduction. For, the diodes represent a certain resistance which depends on the magnitude of this direct voltage. In Fig. 43 this resistance is represented by the tangent to the diode-characteristic.

If there is no direct voltage on points A and B, the diodes are cut off and the attenuation is provided by R636 and T638 only.

D.N.L. BLOCK DIAGRAM

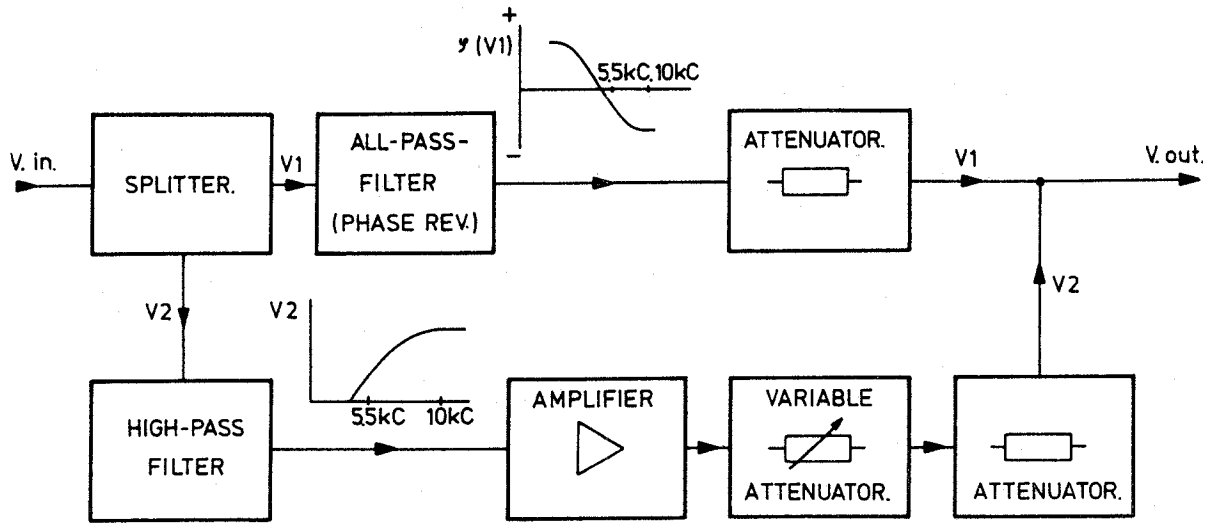


Fig. 41

SIGNAL CONTROL CIRCUIT

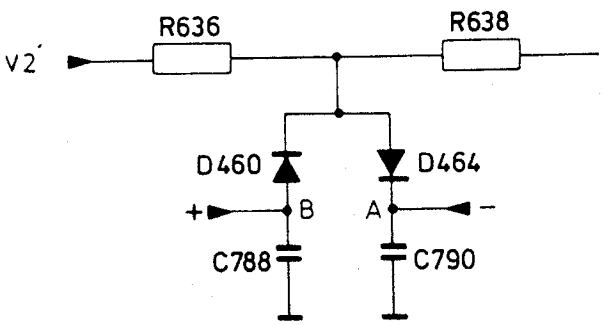


Fig. 42

DIODE CHARACTERISTIC CURVE

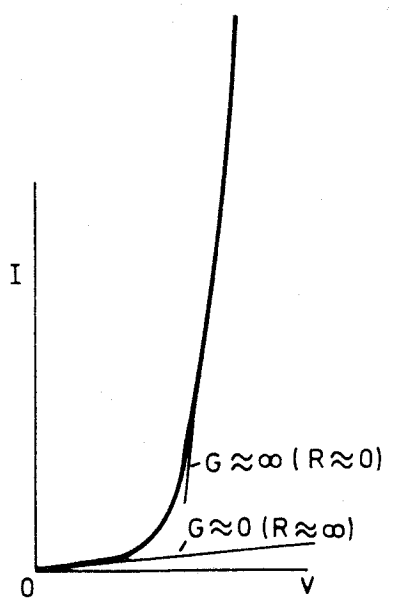


Fig. 43

ENGINEER'S NOTES

MISC.	Z468. D467. D466. TS446÷453. D454÷465.	SK2. D474. D475. TS470÷473. D477.
C	796÷799. 772÷795.	825÷827. 528÷531.
R	642÷645. 600÷641.	481. 480. 656÷664. 669÷669.

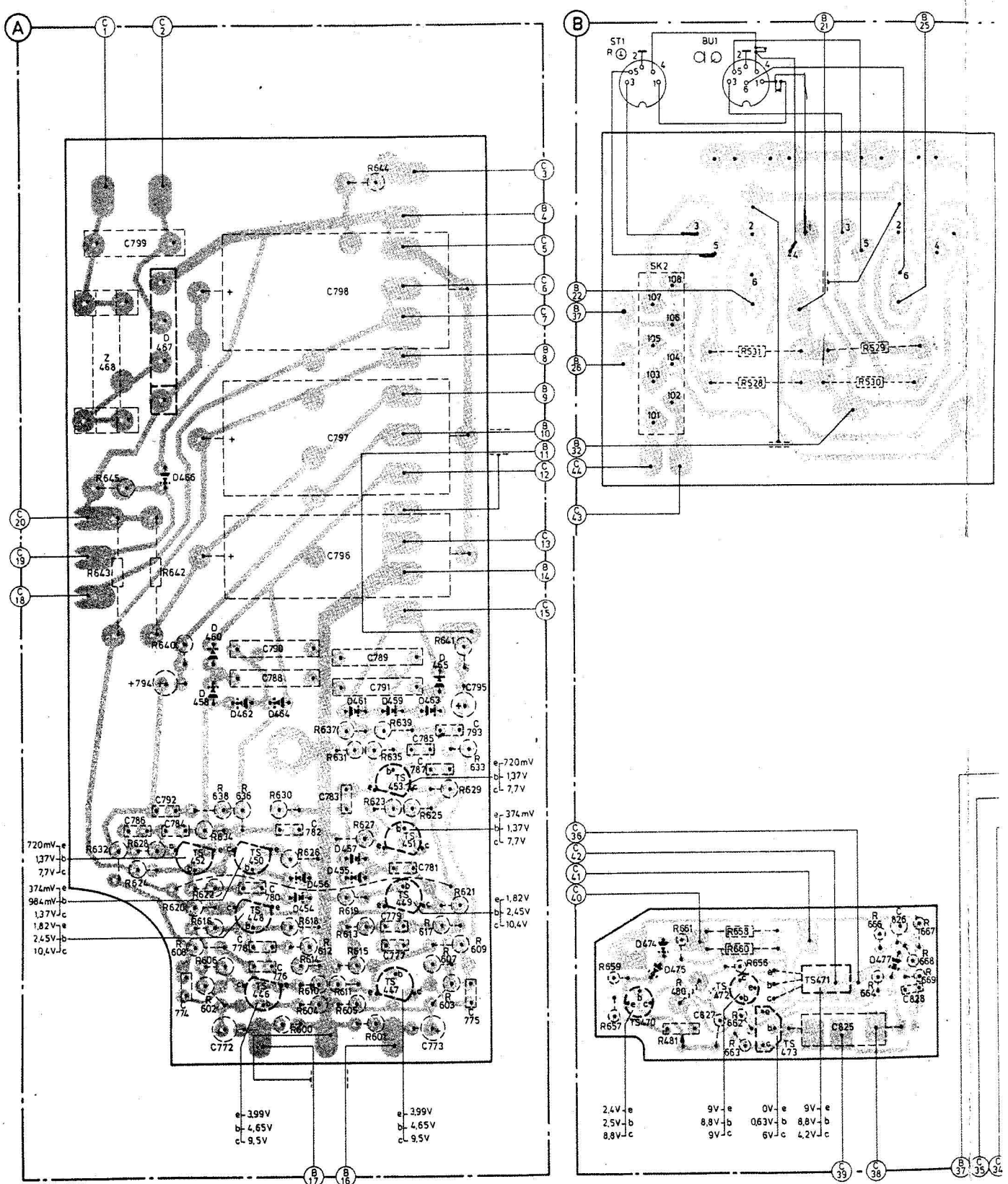


Fig. 44

TAPE DECK N 2505/51 BOARD LAYOUT AND CONNECTION DIAGRAM

S446÷453. D454÷465.
796÷799.
772÷795.
642÷645.
600÷641.

SK2.
D474. D475. TS470÷473. D477.
825÷827.
528÷531
481. 480. 656÷664. 669÷669.

TS426.
770 769.
748. 768.
592.
594.

TS428÷434. D437.
SK1 TS427.
760÷767. 750÷759. 742÷747.
726÷731. 734÷741.
559÷565. 568÷590. 551÷557
558. 566. 591. 567. 532÷550. 595. 526. 5

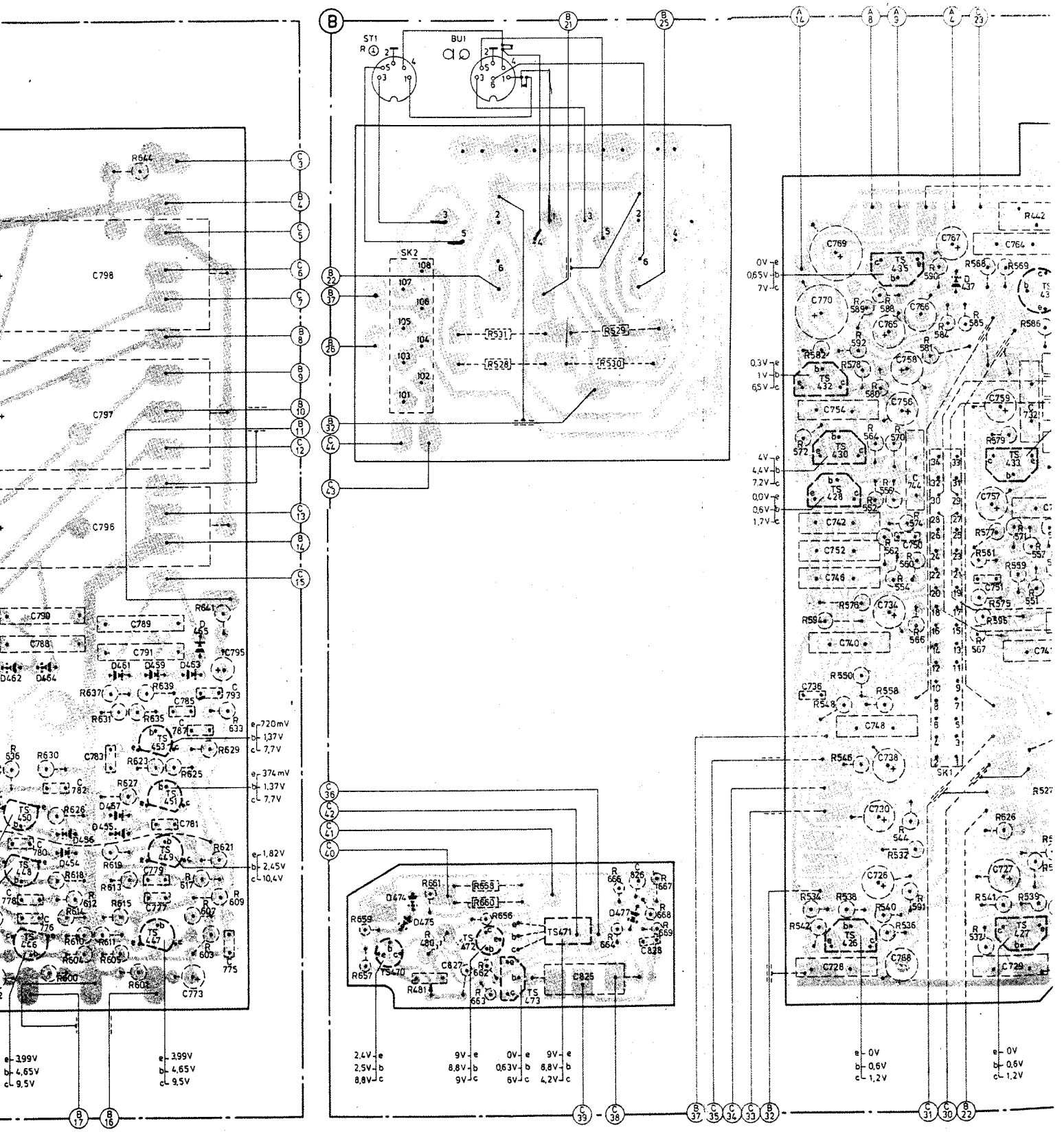


Fig. 44

D LAYOUT AND CONNECTION DIAGRAM

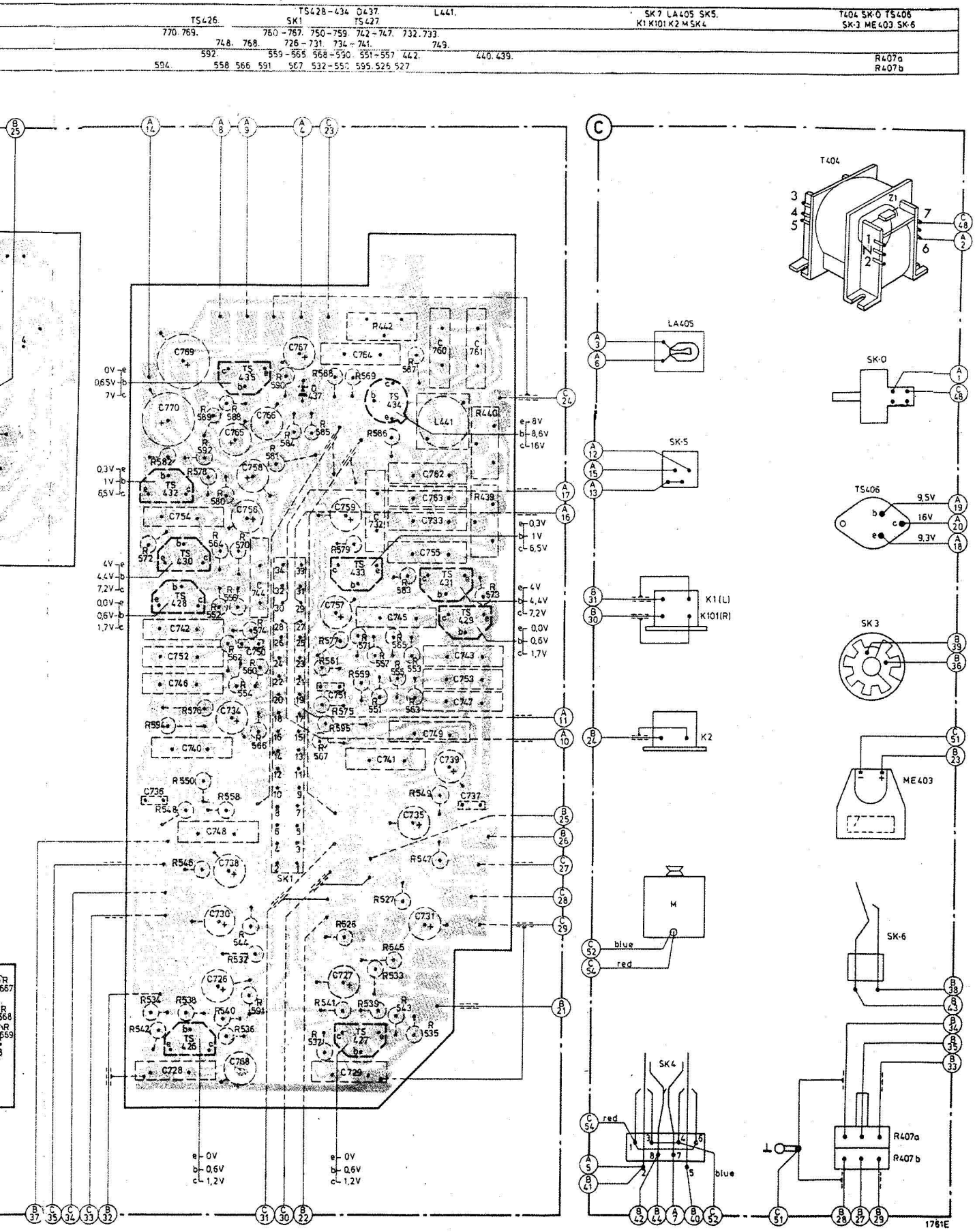


Fig. 44

LIST OF ELECTRICAL COMPONENTS

Transistors		Part No.
TS406	AD161	4822 130 40212
TS426	BC149B	4822 130 40313
TS427	BC149B	4822 130 40313
TS428	BC148A	4822 130 40317
TS429	BC148A	4822 130 40317
TS430	BC148B	4822 130 40318
TS431	BC148B	4822 130 40318
TS432	BC148A	4822 130 40317
TS433	BC148A	4822 130 40317
TS434	BC107B	4822 130 40332
TS435	BC148B	4822 130 40318
TS470	AC127	4822 130 40096
TS471	AC128	4822 130 40095
TS472	AC188	4822 130 40456
TS473	BC149C	4822 130 40216
Diodes		
D437	OF173	4822 130 30301
D450	BZY88/C9V1	4822 130 30294
D451	BY164	4822 130 30414
D474	BA114	4822 130 30189
D475	BA114	4822 130 30189
D477	BA217	4822 130 30703
Coil		
L441	Erase oscillator coil	4822 156 20459
Resistors		
R407	Potentiometer 2 × 22 kΩ	4822 102 30152
R439	Preset potentiometer 47 kΩ	4822 100 10076
R440	Preset potentiometer 47 kΩ	4822 100 10076
R442	Preset potentiometer 22 kΩ	4822 100 10086
R480	Wire-wound resistor	4822 157 50013
R528	1 MΩ, 1/8 W, 5%	4822 110 61187
R529	1 MΩ, 1/8 W, 5%	4822 110 61187
R530	1 MΩ, 1/8 W, 5%	4822 110 61187
R531	1 MΩ, 1/8 W, 5%	4822 110 61187
R538	470 kΩ, 1/8 W, 5%	4822 110 61178
R539	470 kΩ, 1/8 W, 5%	4822 110 61178
R552	560 kΩ, 1/8 W, 5%	4822 110 61181
R553	560 kΩ, 1/8 W, 5%	4822 110 61181
R564	1·2 MΩ, 1/8 W, 5%	4822 110 60189
R565	1·2 MΩ, 1/8 W, 5%	4822 110 60189
R578	390 kΩ, 1/8 W, 5%	4822 110 61176
R579	390 kΩ, 1/8 W, 5%	4822 110 61176
R588	390 kΩ, 1/8 W, 5%	4822 110 61176
R594	1 Ω, 1/4 W, 5%	4822 116 60005
R595	1 Ω, 1/4 W, 5%	4822 116 60005
Capacitors		
C730	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C731	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C734	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C735	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C738	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C739	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C756	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C757	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342

Capacitors		Part No.
C758	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C759	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C765	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C767	Electrolytic capacitor 1·5 µF, 63 V	4822 124 20342
C728	Polyester capacitor 2·7 nF	4822 121 40271
C729	Polyester capacitor 2·7 nF	4822 121 40271
C732	Polyester capacitor 1 nF	4822 121 40269
C733	Polyester capacitor 1 nF	4822 121 40269
C740	Polyester capacitor 82 nF	4822 121 40058
C741	Polyester capacitor 82 nF	4822 121 40058
C742	Polyester capacitor 10 nF	4822 121 40047
C743	Polyester capacitor 10 nF	4822 121 40047
C744	Polyester capacitor 1·8 nF	4822 121 40299
C745	Polyester capacitor 1·8 nF	4822 121 40299
C746	Polyester capacitor 3·9 nF	4822 121 40169
C747	Polyester capacitor 3·9 nF	4822 121 40169
C748	Polyester capacitor 15 nF	4822 121 40049
C749	Polyester capacitor 15 nF	4822 121 40049
C750	Ceramic capacitor 100 pF	4822 122 30021
C751	Ceramic capacitor 100 pF	4822 122 30021
C752	Polyester capacitor 6·8 nF	4822 121 40222
C753	Polyester capacitor 6·8 nF	4822 121 40222
C754	Polyester capacitor 2·7 nF	4822 121 40271
C755	Polyester capacitor 2·7 nF	4822 121 40271
C760	Polyester capacitor 68 nF	4822 121 40057
C761	Polyester capacitor 68 nF	4822 121 40057
C762	Polyester capacitor 4·7 nF	4822 121 40168
C763	Polyester capacitor 33 nF	4822 121 40054
C764	Polyester capacitor 10 nF	4822 121 40047
C766	Electrolytic capacitor 6·8 µF	4822 124 20351
C768	Electrolytic capacitor 33 µF	4822 124 20368
C769	Electrolytic capacitor 68 µF	4822 124 20376
C770	Electrolytic capacitor 68 µF	4822 124 20376
C801	Electrolytic capacitor 220 µF	4822 124 20398
C802	Electrolytic capacitor 1000 µF	4822 124 20417
C803	Electrolytic capacitor 1000 µF	4822 124 20419
C825	Polyester capacitor 680 nF	4822 121 40258
C826	Electrolytic capacitor 2·2 µF	4822 124 20344
C827	Electrolytic capacitor 0·64 µF	4822 124 20092
C828	Ceramic capacitor 120 pF	4822 122 30093
Miscellaneous		
ME403	Recording level indicator	4822 347 10051
T404	Mains transformer	4822 145 50049
L405	Indicator lamp, 6 V, 45 mA	4822 134 40032
SK0	Mains switch	4822 276 10429
SK1	Slide switch	4822 277 30459
SK2	Playback switch	4822 276 10376
SK4	Motor switch	4822 278 90223
SK6	Pause switch	4822 278 90008
BU2	Socket—micro/PU	4822 267 40162
Z1	Transformer fuse 138°C, 1·5 A	4822 252 20007
Z452	Glass fuse 630 mA	4822 253 30018
	Spring for glass fuse	4822 492 60063
	Motor control/aut. stop pc board	4822 214 50086
	Contact spring for socket	4822 268 20032
	Nylon bracket on slide of SK1	4822 528 20153
	Pen in nylon bracket	4822 528 30138

ENGINEER'S NOTES

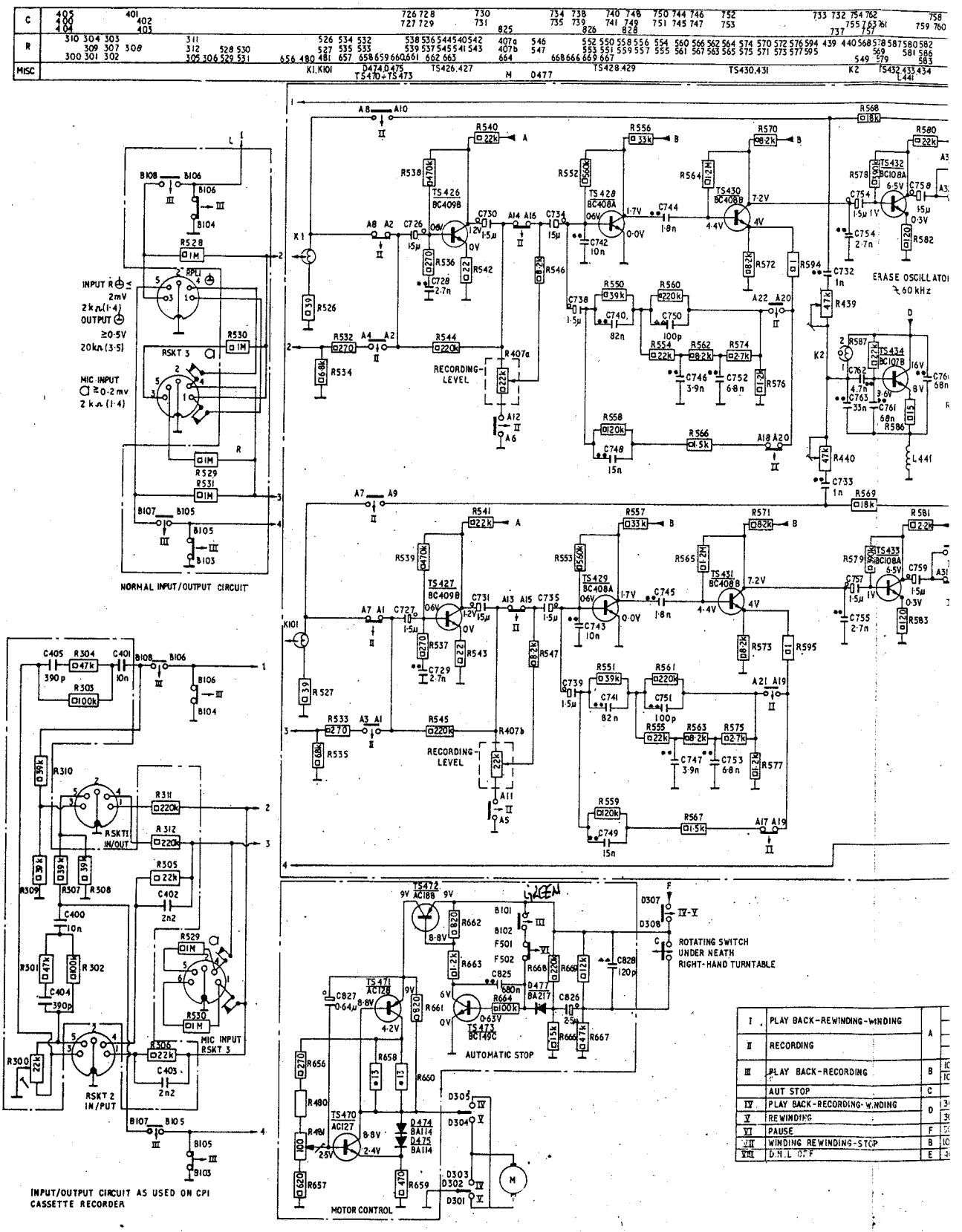
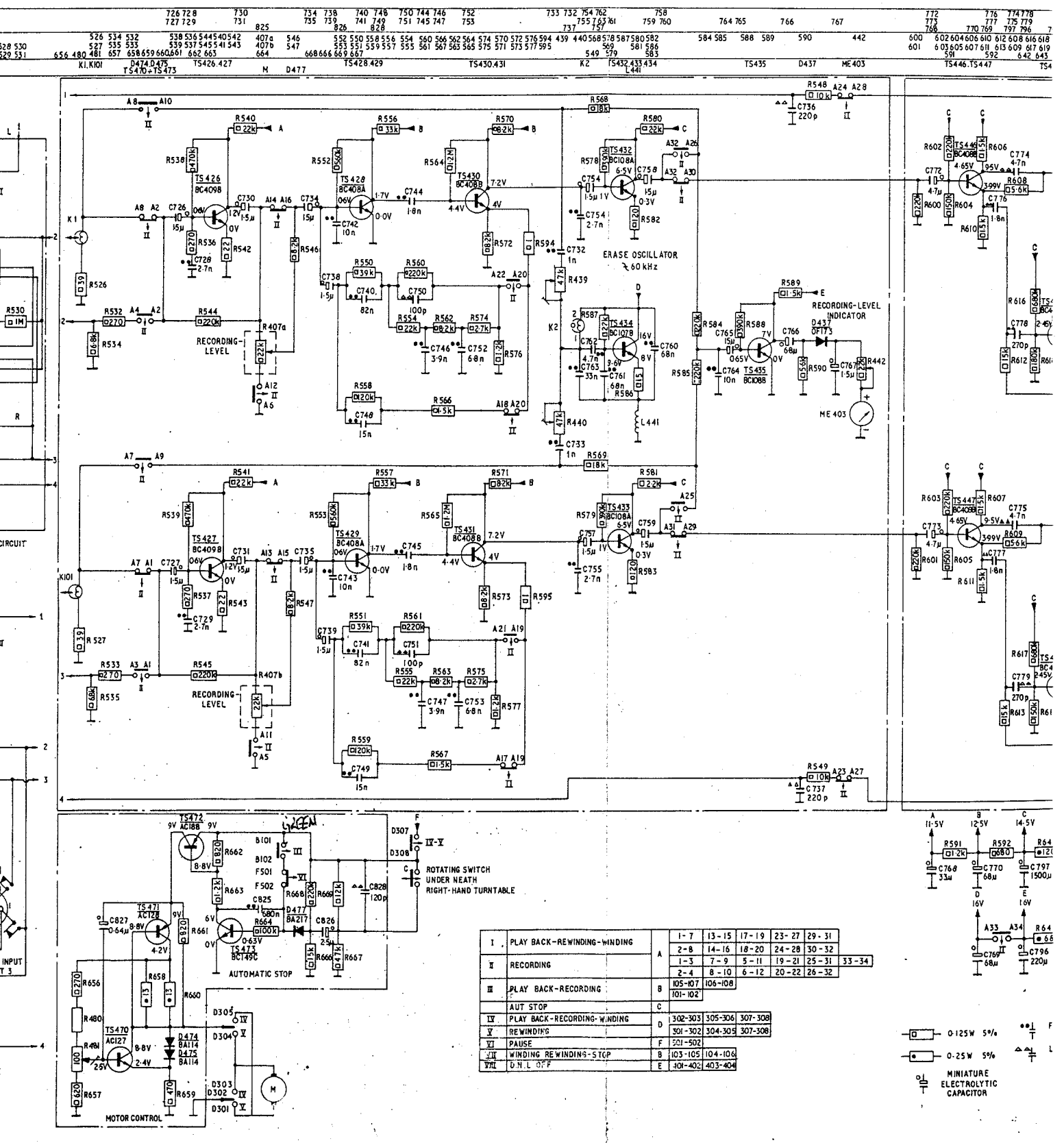

C
R
MISC
INPUT
2mV
2kΩ(1-4)
OUTPUT
≥0·5V
20kΩ(3-5)
MIC INPUT
≥0·2mV
2kΩ(1-4)
RSKT 3
NORMAL INPUT/OUTPUT CIRCUIT
RECORDING-LEVEL
ERASE OSCILLATOR
60kHz
RSKT 1 IN/OUT
RSKT 2 IN/PUT
MIC INPUT RSKT 3
INPUT/OUTPUT CIRCUIT AS USED ON CPI CASSETTE RECORDER
AUTOMATIC STOP
MOTOR CONTROL
ROTATING SWITCH UNDER NEATH RIGHT-HAND TURNTABLE
I PLAY BACK-REWINDING-WINDING
II RECORDING
III PLAY BACK-RECORDING
AUT STOP
IV PLAY BACK-RECORDING-W.NDING
V REWINDING
VI PAUSE
VII WINDING REWINDING-STOP
VIII D.N.L OFF

Fig. 45

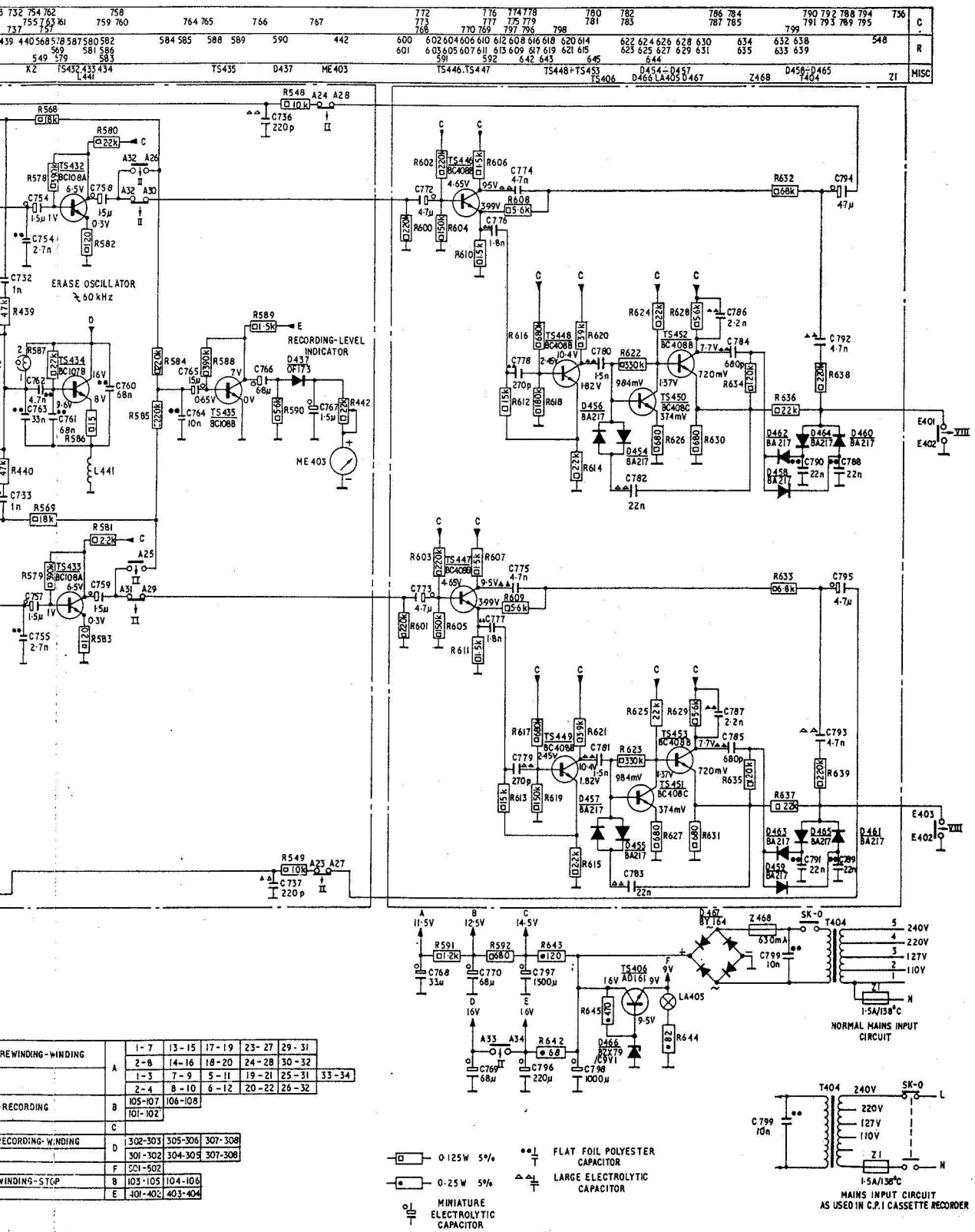
DECK N2505/51



I	PLAY BACK-REWINDING-WINDING	A	1-7	13-15	17-19	23-27	29-31
			2-8	14-16	18-20	24-28	30-32
II	RECORDING		1-3	7-9	5-11	19-21	25-31	33-34
			2-4	8-10	6-12	20-22	26-32
III	PLAY BACK-RECORDING	B	105-107	106-108			
			101-102				
	AUT STOP	C					
IV	PLAY BACK-RECORDING-WINDING	D	302-303	305-306	307-308		
V	REWINDING		301-302	304-305	307-308		
VI	PAUSE	F	501-502				
VII	WINDING REWINDING-STOP	B	103-105	104-106			
VIII	D.N.L OFF	E	401-402	403-404			

Fig. 45

DECK N2505/51



REWINDING-WINDING	A	1-7	13-15	17-19	23-27	29-31
		2-8	14-16	18-20	24-28	30-32
		1-3	7-9	5-11	19-21	25-31	33-34
		2-4	8-10	6-12	20-22	26-32
RECORDING	B	105-107	106-108			
		101-102				
	C					
RECORDING-WINDING	D	302-303	305-306	307-308		
		301-302	304-305	307-308		
	F	501-502				
WINDING-STOP	B	103-105	104-106			
	E	401-402	403-404			

Fig. 45

LIST OF COMPONENTS FOR CHASSIS SA29, SRX29 and SRX30

Part No.	Description
S.7001	Volume control. 25K.
S.7002	Treble Control. 100K.
S.7003	Bass Control. 250K.
S.7004	Balance Control. 25K. (Not same as V/Con)
S.7005	Filter toggle switch.
S.7006	Selector switch bank.
S.7007	Selector switch bank (SA 29 only).
S.7009	V.H.F. push-button assembly.
S.7011	Tuning gang.
S.7013	Mains Transformer—TOROIDAL.
S.7014	Mains Transformer—'C' CORE
S.7016	LP.1186 Module.
S.7017	LP.1185 Module.
S.7018	LP.1181 Module.
S.7019	Ultrasonic filter board.
S.7020	Oscillator coil. 5 K10E.—S.W.
S.7021	Oscillator coil. 3K10E1.—M.W.
S.7022	S.W. aerial coil.
S.7025	Medium wave aerial coil.
S.7026	Long wave aerial coil.
S.7030	Capacitor 2200 MFD 40V.
S.7039	Rectifier assembly.
S.7041	Printed glass scale.—SRX 30 only.
S.7042	Escutcheon for SRX 30.
S.7042A	Escutcheon for SA 29A.
S.7043	Escutcheon for SRX 29A.
S.7043A	Escutcheon for SRX 29B.
S.7044	Knob (wave change and selector switches).
S.7045	Knob (Slider controls).
S.7093	Pointer—SRX 29 only.
S.7102	Perspex cover HFC 52, 53, 56 and 57.
S.7103	Tuner board.
S.7104	Main amp. assembly.
S.7105	Power supply panel.
S.7107	Input selector panel. Assembly.
S.7108	Tone control board.
S.7109	Input selector board—SA 29 only.
S.7115	Perspex cover HFC 50, 51, 54 and 55.

ENGINEER'S NOTES